

THE RAILWAY GAZETTE

A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer • TRANSPORT • The Railway News
The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.
RAILWAYS ILLUSTRATED ESTABLISHED 1935 • RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY

AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (6 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 63. No. 25

FRIDAY, DECEMBER 20, 1935

CONTENTS

	PAGE
Editorials	1049
Letters to the Editor	1054
Publications Received	1055
The Scrap Heap	1056
Overseas Railway Affairs	1057
Streamlining Seventy Years Ago	1059
New Nord Carriage Inspection Sidings in Paris	1060
Machining of Railway Wheels and Tyres	1061
Fifty Years of Railway in Malay, 1885-1935	1063
A New Electric Tamper	1066
Road Transport Sections	1069
Railway News Section	1075
Personal	1075
News Articles	1077
Official Notices	1083
Railway Share Market	1084

Christmas Decorations at Paddington

FOR three years now the Great Western Railway has decorated the "lawn" at Paddington station. This week has seen a distinct advance on anything yet attempted by the company, and many passengers have already paid tribute to the beauty of the scene. The glass roof above the "lawn"—as the large circulating area at the top of the platforms is known—has been hidden behind a starry sky, while directly below, is a snow-covered windmill, standing 18 ft. from the ground, with sails made of bon-bons. Suspended from the middle is a gigantic cut-out of Father Christmas apparently holding a bon-bon thirty-five feet long, inscribed with the words "100th Christmas" to mark the centenary year of the company, and the four pillars supporting the roof of the station have been converted into bon-bons, 20 ft. high, with large comic motifs. In front of each pillar, forming a guard of honour, stand ten-foot wooden soldiers resplendent in scarlet and gold uniforms and busbies. These decorations, which will be kept up till the end of the year, were effected during last week-end by a group of workmen, using among other materials, 18,000 ft. of wood, 2,000 yd. of cloth and miles of wire. The "lawn" was officially opened on Monday morning by Miss Florence Desmond, the actress, Sir Robert Horne, Chairman of the G.W.R., presiding at the ceremony. The illuminated banner, bearing the company's Christmas greetings to each and every one of its patrons will be heartily reciprocated by hundreds of passengers who use the station daily.

as well as by the estimated half a million holiday makers who will cross the "lawn" between now and Christmas Day.

* * * *

George Francis Thurston

In our issue of December 6, we recorded the impending retirement of Mr. G. F. Thurston from the position of Divisional General Manager, Southern Area, L.N.E.R., and on page 1075 of this issue will be found his portrait and a brief outline of his career. It is a remarkable one for, *inter alia*, the widely differing posts held by him from time to time. His first two appointments were in the Goods Department of the former Great Eastern Railway, but within five years of his joining the railway he was transferred to the Funds Office. Then, seven years later, when the Railway Conciliation Scheme came into being, he was selected for appointment as Secretary of the company's side of the respective boards, only to become successively Secretary of the Superannuation, Pensions and Accident Funds, Staff Assistant to the General Manager, Secretary to the company and finally—so far as secretarial duties were concerned—Joint Secretary of the L.N.E.R. group. Then, in 1925, destiny willed that he should be appointed Chief Stores Superintendent, a position he occupied for four years and until he took up the reins of chief executive officer in the Southern Area. Mr. Thurston's experience has therefore been wide and unusually varied, and throughout his notable career his equable temperament has made him very popular among all with whom he has come in contact. We now join his many other personal friends in wishing him a long and happy period of retirement.

* * * *

The Week's Traffics

Increases in merchandise and coal for the past week have more than made up for the shortages in passenger train earnings of the four group companies except on the Southern. The grand total of the four companies together for the 50 weeks of the current year is estimated at £145,076,000, an increase of £1,357,000, or 0.94 per cent. Passenger train earnings aggregate £64,777,000, an improvement of £1,177,000, or 1.85 per cent. The largest passenger train increase, both actually and proportionately, is that of £394,000, or 2.72 per cent., on the Southern. In merchandise the L.M.S.R. has an increase to date of £252,000, or 1.12 per cent., and for all four companies the net increase is £131,500. Coal traffics on the L.M.S.R. show an increase of £181,000, or 1.57 per cent.

	50th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R. . .	8,000	32,000	25,000	45,000	798,000	+ 1.39
L.N.E.R. . .	6,000	8,000	4,000	6,000	155,000	+ 0.36
G.W.R. . .	8,000	2,000	12,000	6,000	227,000	+ 0.94
S.R. . .	10,000	3,000	1,000	12,000	177,000	+ 0.92

London Transport receipts for the 24 weeks amount to £13,075,300, an increase of £217,000.

* * * *

Mexican Railway Half-Year

Trade in Mexico continued to expand during the first six months of 1935, and the gross receipts of the Mexican Railway improved by 379,900 pesos, or 6.3 per cent., as compared with the first half of 1934. Working expenses, however, increased by 504,653 pesos, or 9.6 per cent., due to demands of the workers and legislative enactments, in spite of all the efforts of the management in Mexico to keep down expenditure. There was a heavy fall in petroleum traffic, but this was more than offset by an all-round increase in general goods. In the accompanying

table results are compared for the first six months of 1935 and 1934 respectively:—

	1935	1934
Passengers	843,185	844,620
Paying goods, tons	454,592	426,076
Traffic train-kilometres	1,189,315	1,175,043
Average haul, km.	202.17	207.68
Operating ratio, per cent.	90.07	87.36
	Pesos	Pesos
Passenger receipts	1,535,976	1,546,693
Goods and live stock receipts	4,520,525	4,128,005
Gross receipts	6,374,733	5,994,833
Working expenses	5,742,005	5,237,352
Net receipts	632,728	757,481

In the accounts the standard rate of 18 pesos to the £ has been maintained, giving net receipts of £35,152, against £42,082 a year ago. Total debit to net revenue is now £468,402.

* * * *

Overseas Railway Traffics

There has been no variation during the past fortnight in the Argentine exchange which has averaged 17.02 pesos to the £ as compared with an average of 17.10 pesos for the corresponding period of last year. In the two weeks each of the four larger companies has improved its traffic position to some extent. The Buenos Ayres & Pacific has added £21,104 gross to its previous increase, and the Central Argentine aggregate increase is better by £11,731 net than it was a fortnight ago. Reductions of previous decreases have been made by the Buenos Ayres Great Southern to the extent of £354 net, and by the Buenos Ayres Western to the extent of £9,992.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific .. 24th	82,609	+	13,369	1,781,123	+ 131,317
Buenos Ayres Great Southern .. 24th	131,434	-	2,777	2,851,489	- 44,374
Buenos Ayres Western .. 24th	52,761	+	8,901	974,122	- 17,876
Central Argentine .. 24th	116,384	+	13,267	2,795,488	- 28,697
Canadian Pacific .. 49th	558,600	+	36,400	24,178,000	+ 688,400
Bombay, Baroda & Central India .. 36th	226,200	-	28,125	5,449,500	+ 9,600

Brazilian Railways show increases to date in currency, but the low rate of remittances has seriously affected their earnings in sterling.

* * * *

An Impression of the German Railway Centenary

At the annual dinner of the Railway Club last Friday, Mr. Kenneth Brown, the President, gave a graphic description of his experiences at the German railway centenary, to which he had been invited to represent the Railway Club. We published an account in our last issue of the main features of the celebrations, but this could give only an inadequate idea of the impressive scale upon which they were carried out. Great Britain having been an important factor in the opening a hundred years ago of the first railway in Germany, it was appropriate that there should have been representatives at the centenary of all the British railways, as well as from the Railway Club, the oldest society of amateur and professional railway enthusiasts in the country. Apart from the purely social functions, the part of the celebrations that most impressed Mr. Kenneth Brown was the parade of rolling stock. It was notable that apart from the full-size facsimile of the first train that ran between Nuremberg and Fürth, hauled by the Stephenson locomotive *Der Adler*, the oldest engine that apparently could be found for this occasion was one built in 1850. For the rest everything was modern, and since the great new national roads come under the administration of the German State Railway Company, there were exhibits of the latest road vehicles. From Nuremberg to Heidelberg the guests were conveyed in two special trains of the latest Mitropa sleeping cars; thence they travelled over the new Reichsautobahn to Frankfurt, where the special trains

were rejoined to convey the party to Berlin. From first to last, according to Mr. Kenneth Brown, everything went like clockwork, and punctuality was observed to the minute.

* * * *

Cleaner Trains

The English have not the reputation of being a very tidy people, and their failings in this respect are often reflected in the condition of railway compartments and stations. Few persons will take the trouble to put used cigarette packets or bus and tram tickets in their pocket and keep them until they find a suitable receptacle or can throw them away at home, although this habit, which is easily acquired with a little thought, would make a great difference to the appearance of many public places. If they cannot cope with carelessness in these matters the railways can attend to the general cleanliness of the carriages both outside and in, and it is satisfactory to think that the subject is receiving more attention as it is realised that bright and attractive trains possess advertising value and assist in meeting competition. The use of electric carriage washing plant is making it much easier to counteract the effects of smoke and weather. A machine is proposed for the new examination sidings at Le Landy, Paris, on the Nord, described in this issue, where, it is interesting to note, the cleaning of the trains is done by outside contractors.

* * * *

Mr. Whitelaw on Railway Students

The cordial relations now existing between railway companies at home and abroad and the various bodies of railway enthusiasts, to which we drew attention in our issue of May 17, was confirmed by Mr. William Whitelaw, Chairman of the L.N.E.R., in a speech at the first annual dinner of the Cambridge University Railway Club last month. Mr. Whitelaw put forward a new argument in favour of such organisations, and one which may be of no less benefit than the material advantage of their railway journeys and travel propaganda, when he said that they helped to spread among the general public a sympathetic understanding of the problems confronting the companies. One question facing the administrations was whether it would be advantageous to amalgamate further; in which connection Mr. Whitelaw remarked that the pooling of receipts had certainly been a success, while the association of the main line railways with the London Passenger Transport Board seemed likely to benefit both themselves and the suburban traveller. Arrangements of this kind enabled expenditure on desirable but not very remunerative works to be balanced by a share in the profits from other sources. Mergers such as London Transport, however, affecting transport media with small sentimental appeal, cause less stir than is likely to be provoked by such schemes affecting the main line railways, and railway students may make the way to their realisation easier by spreading the knowledge that monopolies need not imply limitation of facilities.

* * * *

An American View of Streamlining

Some cryptic utterances were made in the paper on locomotive streamlining recently presented by Mr. Otto Kuhler at a meeting of the New York Railroad Club. The locomotive designer, it was stated, was forced by the demand for more and ever more power within given clearances to build his engine longer and longer, whilst the protruding parts such as the chimney, dome, &c., had to be reduced in height, so that something approaching to the ideal streamlined silhouette was arrived at by the normal process of evolution. Another statement made

by the author was that most of the freak streamlined locomotives recently built were badly conceived in their outline, shrouding, and covering, and in most the inherent beauty and "personality" of the locomotive was entirely lost. The very fact that the designer is reluctant to go to the limit in streamlining indicates, Mr. Kuhler maintained, that the ultimate aerodynamic streamlined form is not practical from the operating point of view, and not justified under the operating conditions of today and tomorrow, at least so far as America is concerned. Easy inspection and maintenance are to a large extent sacrificed, and there are other objections which largely mitigate the effectiveness of streamlining. If correctly planned, the shrouding of a steam locomotive for streamlining should not make the engine unsightly, and the most acceptable type, in Mr. Kuhler's view, is that which, whilst covering in the boiler, front end, and cab, leaves the wheels and cylinders exposed and so accessible for inspection and maintenance.

* * * *

The Triple Yellow Aspect

In order to allow of fast running and a minimum headway of $2\frac{1}{2}$ minutes under clear signals when electric traction is introduced on the Paris-Sceaux line, the working of which is then to be undertaken by the Metro instead of the Paris Orleans, automatic four-indication block signals are to be installed. These will include, we believe for the first time anywhere, a triple yellow aspect. A single green light will mean "all right," and a stop signal will be preceded first by a single yellow, then double yellow, then triple yellow. The stop indication will be given by a single red light when controlled from an open signal box, while double red will signify that the signal may be regarded as automatic and passed under the emergency rule. In this way the accidental failure of a unit will not cause the display of a less restrictive indication than the one intended, and all warning indications will consist of yellow lights only. These aspects differ from those used on the existing Metro lines, while the stop indications are exactly the reverse of those prescribed by the new main line code, given in our issue of November 22. Special ministerial approval must therefore have been obtained for the Sceaux line signalling, but as there will be no through running with other systems, there seems no objection to the use of new aspects suited to the special conditions obtaining.

* * * *

High Speed on the Nord in the 1900's

The part played by the Chemin de fer du Nord in setting a standard of fast running which has only of recent years been generally emulated, is described in a recent issue of our French contemporary, *Transports*. As early as 1900, a 4-cylinder compound 4-4-0 of the 2160-2180 series covered the 95.1 miles from Paris to St. Quentin with the Nord Express (weighing 113 tons) in 85 min. 15 sec., notwithstanding a severe relaying slack. A minimum of 67 m.p.h. was noted up the 1 in 200 to Survilliers, and 76 m.p.h. was maintained on the level. The well-known Mechanical Engineer of the Nord, M. du Bousquet, and Mr. Charles Rous-Marten travelled on the footplate on this occasion. The introduction of the de Glehn Atlantics (then unsuperheated) in 1902 produced some notable feats, particularly of time recovery. A gain of 25 min. on the 2 hr. 50 min. schedule of the 6.25 p.m. Boulogne-Paris boat train was recorded to the credit of No. 2656, hauling a 158-ton train. The 49.8 miles between Amiens and Creil were run in 40 min. (pass to pass), and the 31.3 miles thenceforward to Paris in 28 min., notwithstanding 25-m.p.h. speed restrictions at both

Amiens and Creil. Speed on falling gradients was as high as 87 m.p.h. On several occasions de Glehn Atlantics gained as much as 40 min. with the Calais-Mediterranean express, a time of 170 min. from Calais to Paris, including a 5-min. stop at Amiens, being achieved with loads of from 158 to 196 tons. The Lille main line also produced examples of fast running and energetic hill-climbing by the de Glehn engines, examples being a time of 58 min. for the 67.7 miles from Soissons to Paris by No. 2660, with 197 tons, and a minimum of $74\frac{1}{2}$ m.p.h. on the last 2 km. to Survilliers by No. 2642, with 140 tons.

* * * *

German Level Crossing Warnings

In spite of the presence of barriers and gatemen at most level crossings, and the provision of flash light warnings at many others, accidents are still caused in Germany by motorists driving into closed barriers, even in broad daylight. As a result of an inquiry into the problem, the Reich Minister of Transport, Freiherr von Eltz-Rübenach, by an order dated September 24, required the installation of warning boards on each side of the road at the approach to crossings, much resembling the railway distant signal boards. The new signs are to be placed at distances of 240, 160, and 80 m. (262, 175, and 87 yd.) from the railway, the first being surmounted by the conventional international signs, viz.: a locomotive for an unattended, and a gate for an attended crossing. The boards are oblong shaped, mounted vertically as on the railway, enamelled white with a black border, and provided with one, two or three transversal rows of red reflectors instead of the black bands of the distant signal boards. Should it be necessary to depart from the regulation distances for local reasons the distance from each board to the railway is to be painted at the top in black lettering. The provision and fixing of the new signs is being done by agreement between the railway and local authorities.

* * * *

Oxidation Losses

Iron and steel production in this country jointly total between seven and eight million tons annually. Assuming the average loss by oxidation and scaling to amount to no more than from 2 to 3 per cent. each year, the gross loss so caused, which is in the nature of a tax on all users, is from 160,000 to 240,000 tons a year. Oxidation is experienced in various forms; atmospheric corrosion attacks all unpainted ironwork and steelwork; scaling seriously affects iron and steel exposed to high temperatures. Scale also has a corrosive effect on refractories, involves additional labour, and reduces the quality of the steel, so increasing the loss. Expenditure arising directly out of oxidation is that of painting all steel structures, and in the case of large structures, such as the Forth Bridge, a permanent and heavy annual expense is involved. Efforts are being made in various ways to combat this attack. Structural steel is now made in considerable quantities with a content of 0.30 to 0.40 per cent. copper, as a corrosion-resistant, and, for special purposes, with a small percentage of chromium as well, which has the double advantage of resisting corrosion and giving added tensile strength. Case-hardening treatments of various kinds are being developed to give resistance to oxidation of iron and steel surfaces exposed to high temperatures, such as locomotive firebars, boiler tubes, and so on. The corrosion of railway rails is a problem which has not yet been seriously attacked, especially in tunnels, where sulphur from locomotive exhaust and damp combine to produce an acid corrosion which is particularly serious in its effect.

Christmas Travel

CHRISTMAS in England is pre-eminently a season of family re-union and goodwill, and to the Postmaster General's innovations of "greetings telegrams" suitably decorated, and cheap telephone rates for Christmas calls, the railway companies have added greeting cards, slotted inside to take railway tickets, which can be sent to friends and relatives with suitable Christmas or New Year greetings. The scheme applies to any kind of railway tickets for use on the outward journey between December 7, 1935, and January 4, 1936, and the railway companies will supply tickets in advance available between any two places served by the main lines or joint lines. Moreover, the companies will forward the tickets direct to the address of the recipient, mentioning the name of the sender or not, as may be desired. This facility will enable members of the public not only to send an invitation for Christmas in a manner which only the most churlish could possibly decline, but also the ticket with which the guests may make the journey. This thoughtful action on the part of the railways might well influence Father Christmas to forsake his traditional method of transport and "rely on the rail" when pursuing his numerous journeys at this festive season.

For those who cannot make use of this facility, but who desire to join the family party for Christmas or the New Year, the railway companies are largely augmenting their existing cheap fare facilities. An extensive range of cheap day tickets at about a single fare for the return journey will be available between December 23 and 28, without restriction as to train service, while numerous cheap travel facilities have been introduced for use in connection with Christmas shopping in London and the principal cities and towns. Elaborate arrangements are also being made by the companies for the collection, conveyance and delivery of the large quantity of Christmas parcels with which they are called upon to deal at this season of the year. Traders and the general public will have the benefit of the low rates for parcels up to 15 lb. in weight which were introduced on July 1, under which parcels up to 3 lb. in weight are conveyed any distance by rail for sixpence, whilst heavier parcels up to 15 lb. are charged on a graduated scale, with a maximum charge of one shilling.

* * *

Federated Malay States Railways

A GREAT improvement in the financial position of the Federated Malay States Railways is disclosed in the report for the year 1934 which we have received from Mr. D. H. Elias, the General Manager. This satisfactory result is associated with the higher prices of Malaya's staple commodities—tin and rubber—leading to an increased labour force, better wages, and improved spending power among all sections of the community. Nevertheless, in its efforts to secure all the traffic it can, the railway administration is still unaided by any real attempt to regulate the intense and uneconomic competition on the roads. Although a Transport Licensing Bill was passed on October 22, 1934, the terms of which were outlined in THE RAILWAY GAZETTE of July 27, 1934, the measure had not become operative when the General Manager's report was written in May of this year. The policy of attracting traffic to rail by granting concessionary fares, special rates, collection and delivery services, publicity, &c., is being vigorously pursued. In the process, however, rates and fares are being forced down to a level which, in many cases, barely covers the cost of movement. Expenditure has been restricted as much as possible but the arrears of maintenance, which accumulated during 1934 and 1933,

are beginning to obtrude, and are now being taken in hand. Since the issue of the report the administration has published an illustrated brochure under the title of "Fifty Years of Railways in Malaya" to commemorate the opening in 1885 of the first railway in the peninsula. Historical and other details compiled from this brochure will be found on page 1063 of this issue.

Railway revenue in 1934 improved by \$2,055,628, or 27.85 per cent. in comparison with 1933. Receipts from passengers increased by \$741,973, or 27.89 per cent., and goods train earnings by 31.79 per cent., but miscellaneous revenue was \$50,045 lower. Apart from the contribution of \$2,804,561 (against \$2,595,044 in 1933 and \$3,103,595 in 1932) to renewals fund there was a saving of \$1,358,206 in railway expenditure, and a profit on railway working of \$740,332 in 1934, against losses of \$2,673,502 in 1933 and of \$1,519,438 in 1932. In 1931 there was a loss on railway working of \$643,251 after making provision for renewals, but in 1930 there was a clear profit of \$36,105. The general financial position for the past two years is indicated in the accompanying table, at a par value of 2s. 4d. for the Straits Settlements dollar.

	1934	1933
	\$	\$
Passenger train receipts	3,958,677	3,121,302
Goods train receipts	5,256,109	3,988,231
Total railway receipts	9,437,228	7,381,600
Railway expenditure (including renewals contribution)	11,501,457	12,650,146
Loss on railway working	2,064,229	5,268,546
Road transport, ferries and harbours (net profit)	222,019	79,939
Rentals, interest, &c. (net)	144,982	67,171
Net deficit	1,697,228	5,121,436

Amongst the ancillary services, docks and harbours in 1934 showed a profit of \$245,035, but on road transport there was a loss of \$481, and on ferries and steamers a loss of \$22,535. Kuala Sawah station on the Seremban-Port Dickson branch was closed on December 1, 1934.

* * *

Tourism

TOURISM has acquired a greater economic significance in many quarters since publicity was given earlier this year to an estimate that the invisible export represented by the expenditure of overseas visitors in Great Britain in 1934 exceeded £25,000,000, and is likely to be substantially higher for 1935. Foremost among the agencies encouraging travel to this country is the Travel & Industrial Development Association of Great Britain and Ireland, with whose work the railway companies have been intimately associated from its inception. The objects of the association are the stimulation abroad of interest in Great Britain and Ireland in order to increase the number of visitors from overseas, to stimulate the demand for British goods and services, and to promote international understanding. Abundant opportunities for publicity exist in the wealth of traditional ceremonies, social functions, political and sporting events, which occur in these islands, as well as the historic buildings, great cathedrals, scenes of history and romance, and above all, the beauty of the English countryside. Experience has shown, however, that efforts to attract visitors must be based on accurate information intelligently and arrestingly presented.

The efforts of the association along these lines, as revealed in its recent annual report, are remarkable for their diversity. One of the most important features of its work is the preparation of illustrated booklets and literature, of which the *Calendar of Events*, printed in four languages, has a circulation of 305,000 copies. Other

booklets deal with the British Isles and London, while in co-operation with local authorities, twelve folders were issued in three languages dealing with various local areas of Great Britain. Without adequate distribution arrangements, the best booklets would be wasted, and distribution arrangements have, therefore, been worked out very carefully. 12,000 centres are supplied throughout the world, and these are constantly being increased in number by the efforts of the Government, railway, steamship and other interests. Photogravure posters of buildings, landscapes, and other interesting things issued by the association are in great demand, while others produced by local authorities have been distributed overseas. There has also been a steady increase in the demand for photographs for reproduction in the foreign press, and periodicals. The success of the association's broadcasting scheme in Canada and the United States is shown by the renewed demand from hundreds of stations for a further series of thirty-six talks similar to those which were broadcast between October and March, 1934-5 to a potential audience of over ten million listeners. These talks have been translated and edited for broadcasting in many other countries throughout the world. New sound films dealing with English life are being widely booked by public cinemas in foreign as well as English speaking countries. The association's film, "So This is London" has been sold to fifteen countries, while newer films are commanding wider interest.

Probably the outstanding event among the association's activities in France was the opening of new premises on the Avenue des Champs Elysées in Paris, where it has obtained a permanent advertisement for British travel on this great thoroughfare. The association also maintains an office in New York which is rapidly increasing its sphere of influence, while representatives in the capitals of many other countries are furthering the activities of the association in many directions. The total income by which the whole of this work is carried on amounted during the last twelve months to £34,000, which includes a Government grant of £4,000. This sum seems remarkably small when compared with the economic advantages of an increased overseas interest in this country, both tourist and industrial, and it is to be hoped that greater financial support will soon be forthcoming, particularly from the Government and local authorities.

* * * *

Railways and the Cinema

IT has been said that "the first movie actress was a locomotive." The reference is to the earliest bioscope days, when the first film producers loved to represent an express coming straight at the audience, with such terrifying realism—or so it seemed then—that nervous on-lookers in the front rows of seats have been known hurriedly to vacate their places. In the course of the years the novelty has worn off, but the train has now definitely taken its place as part of the scenario-writer's stock-in-trade. The novelist is content to mention that his heroine left a certain terminus on a journey; the film-producer must show the train actually starting, with all the characteristic bustle accompanying its exit, and the sights and sounds of railway working. Whole films, like the immensely popular "Rome Express," have been built round a railway journey. What is more, the world is now full of well-informed critics, so that an increasing standard of accuracy is demanded in film productions which introduce railway scenes. This involves the film producer in the use of real railway plant, and in co-operation with the railways themselves to a considerable extent.

There should be no reluctance on the part of the railways to provide such assistance, for although the thundering express may spell romance, give the idea of going to places and doing things, and so provide excitement for the audience, it is at the same time a valuable publicity agent for the railways in representing the train as the normal method of getting from place to place.

So great a part does the train play in American film productions that the Fox Film Company has erected a building measuring 500 ft. × 150 ft. × 90 ft., and has equipped it permanently as a "train set." There is a standard gauge track extending the full length and beyond, with a full-size "property" locomotive and four cars, equipped with regulation Westinghouse brakes, and the train is moved to and fro with wire ropes by means of an electric winch, which is of considerable value in view of the constant repetitions taken of any one subject, before the ideal is secured. Exterior parts of the locomotive are moved by mechanical means. In order not to interfere with microphone recording, steam is led to the engine and the steam-heat connections of the coaches by a 6-in. hose, and then distributed where required by electric fans. Many transformations have to be effected to suit particular films. For the shooting of "Orient Express," the American coaches had to be changed to European standard designs, and for this purpose complete working drawings were obtained from a Belgian firm. Every distinguishing mark of the European stock, from heavy forgings down to internal fittings, was duplicated as nearly as possible, where practicable by spare equipment or "junk" bought from the local railway shops, and otherwise made in the film company's own workshops.

A more difficult task was that of perfecting "Bombay Mail." This required numerous real station scenes on the journey between Bombay and Calcutta, at various recognised stopping-points, which had to be accurately portrayed, or, as the account has it in an American contemporary from which we have drawn these details, "East Indian fans would squawk." Negotiations were therefore opened up between the film company and the Southern Pacific Railroad, where stations with roughly the right amount of trackage were settled on as the most suitable for the purpose, and agreement was reached as to the amount of camouflage each station would require in order to figure with reasonable accuracy as its Indian counterpart. A set of "flats"—bogie open cars—was leased by the S.P.R.R. to the Fox Company with working drawings, and on these the latter built superstructures which, from the photographs available, gave a remarkably accurate representation of Indian coaches, with their sunblinds. In this connection, the studio research department has an extensive file of clippings on railway subjects taken from railway magazines, advertisements, travel articles, and so forth, which provide valuable information as to the details of railway equipment and working. A locomotive of suitable appearance was loaned from the S.P.R.R., had buffers substituted for the cowcatcher, was fitted with sunblinds to the cab, and otherwise transformed. The "shooting" was done during ordinary working hours, between the regular trains, and many railwaymen who might pass, by their looks, as Orientals, had the chance of their lives to figure for a brief space as screen stars in embryo. What is more, a few skilled railway people, needed to help in the working out of the picture from the railway operating point of view as "technical directors," derived some comfortable salaries for their services, and the opportunity of consorting with the real stars to boot. Such is the association between the railway and the cinema, which is constantly becoming closer and more important.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Closing the Brill Branch

London, December 16

TO THE EDITOR OF THE RAILWAY GAZETTE

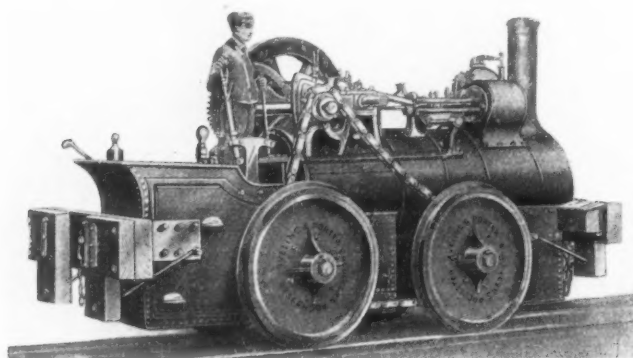
SIR,—The interesting article appearing on p. 982 of your issue of December 6 with the above as its title mentions the small Aveling & Porter four-wheeled single-cylinder locomotives, one of which is illustrated on p. 978. These were, I believe, virtually speaking traction engines mounted on flanged wheels for running on railway tracks, geared mechanism being employed for transmitting motion from the flywheel-fitted crankshaft to the "road" wheels. Hence the absence of side rods.

Yours faithfully,

INTERESTED

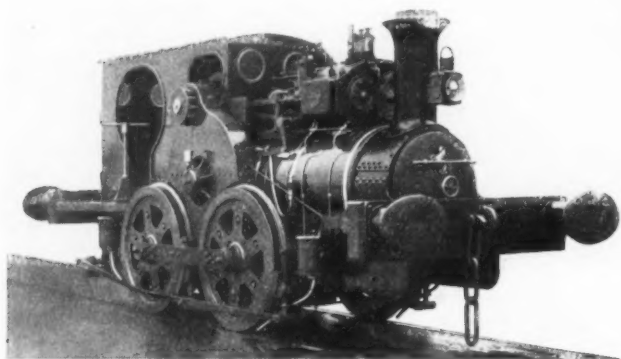
[In January, 1872, the Duke of Buckingham, the owner of the Wotton Tramway (as the Brill branch then was), obtained

but with interesting differences. The surviving records of the new one, No. 846, are meagre, but it is probable that the boiler was built of Lowmoor iron. Apparently there was spur reduction gear between the crankshaft and the driving sprocket, as the builders have notes of replacements of an 11-tooth pinion and a 35-tooth spur wheel, to the latter of which was bolted a 9-tooth chain sprocket. The single cylinder, $7\frac{1}{4}$ in. dia. \times 10 in. stroke, was situated above the boiler, with a flywheel of about 3 ft. 6 in. dia. on the crankshaft. The firm of Aveling & Porter, which was established in 1850, is now incorporated in Aveling-Barford Limited, of Grantham. The latter still has a locomotive broadly similar to the original traction engine type working daily in its sidings at Grantham. This was built in 1899 and appears likely to give good service for some years yet. All four wheels are driven, but by spur gears.—ED., R.G.]



Aveling & Porter traction engine type locomotive of 1866

from Aveling & Porter, of Rochester, a single-cylinder locomotive of the traction engine type. It bore the maker's number, 807, and was driven direct from a 5-tooth chain sprocket on the crankshaft; a new sprocket was supplied by the builders in 1914. The boiler tubes were 5 ft. 7 in. long and $2\frac{1}{4}$ in. in diameter. This engine was of the type we illustrate herewith, which was a standard product of the Rochester firm from 1866 onward. The Duke secured from the same firm in June, 1872, a second engine of generally similar type,



Shunting engine still in service in the Grantham sidings of Aveling-Barford Limited

L.N.E.R. Improvements

GRAIN WAREHOUSE, BOSTON.—In view of the importance of Boston as a centre for the grain trade, the L.N.E.R. has decided to expend a considerable sum upon improvements to the grain warehouse at this depot. Each of the three floors of the existing structure is to be strengthened to permit of the storage of additional traffic to the extent of 650 tons of grain a week. This will enable a quicker release of wagons to be achieved and will considerably facilitate the business transacted by grain merchants at Boston.

IMMINGHAM DOCK.—The L.N.E.R. is providing four additional grabs at Immingham Dock for unloading ore from ships. These are in addition to two 30-cwt. grabs provided some little time ago, and when installed will enable unloading to take place simultaneously from all holds of a steamer at one berth, and in addition it will be possible at the same time for discharge to take place through the two largest holds of another steamer at an adjacent berth. The provision of these grabs will considerably facilitate the quick turn-round of vessels of iron ore entering Immingham Dock.

SKEGNESS.—The L.N.E.R. has decided to provide nine additional sidings at Skegness, each with a minimum length of 850 ft., for the storage of empty excursion trains; and a triangle for turning locomotives, together with an engine pit 120 ft. in length and new coaling stage and water crane. The total cost of the scheme is in the region of £10,000. The number of trains arriving at and departing from Skegness varies from 304 during a typical week in May to 563 during a typical week in August, while the number dealt with in any one day varies from 93 in May to 126 in August.

YORK STATION.—A new and enlarged booking office has been opened at York station, L.N.E.R. The new booking office front is constructed in polished Hopton Wood stone, stainless steel, and black anodised Birmabright. The indicating numbers to the windows are in enamel bronze, and the plate glass sliding windows are adjustable to any desired opening, being hung on spring balances. The floors and display window to the enquiry office are on oak, with ebonised finish on outside, and polished inside to match the internal fittings. All desks and counters are in selected wainscot oak. The ticket tubes are of the latest portable type, with brass ticket tubes in oak frames. All the constructional work and internal fittings were carried out by the District Engineer, York, to the design of the Architectural Assistant to the Engineer. Curtis & Son, of Leeds, supplied and fixed the polished stone and stainless steel front.

PUBLICATIONS RECEIVED

Industrial Architecture. Edited by C. G. Holme. London: The Studio Limited, 44, Leicester Square, W.C.2. New York: The Studio Publications, Inc., 381, Fourth Avenue. 11½ in. × 9 in. × 1 in. 208 pp. Fully illustrated. Price 30s. 0d.—This book contains photographs, splendidly taken and beautifully reproduced, of the most notable achievements, within recent years, of some 134 architects of various nationalities. The illustrations are of factories and workshops, power plants, tunnel works, garages, research stations, markets, railway works, welfare works, water towers, and miscellaneous buildings. The aim of the book, according to the dust cover, is "to put before the industrialist a reliable guide to the potentialities of the architecture of industry today, a means of comparison of its advantages or disadvantages to himself in his own industry and an opportunity to judge for himself what has already been accomplished." Mr. L. H. Bucknell, F.R.I.B.A., contributes an explanatory introduction.

The photographs are accompanied by short descriptions, and brief accounts of the principal factors that influenced the various designs. Several of these accounts explain that in designing the building the architect studied the requirements of the particular industry, and the easy working flow of the manufacturing processes. In talk about modern industrial architecture this planning for particular requirements is spoken of almost as if it were a new idea, the offspring of modern intellects. This is hardly polite to our forefathers, who quite possibly also had the notion of studying the needs of the business they were housing, and built according to the best of their skill with the materials at their disposal. Brains are not a sudden growth of the 20th century. As this book shows, new materials and consequent changes in building regulations allow longer spans, thinner walls, and more slender vertical supports than our predecessors could command, and modern architecture rightly takes advantage of the new possibilities, even to the point of deceiving itself. An uninterrupted range of windows may look efficient, and give good light, but one wonders if much is gained when the effect is produced by cantilevering the upper storeys, with the vertical supports still there, but placed a foot or two inside, getting in the way and casting some shadow. In considering these designs it should be remembered that mere bulk has a certain appeal that does not depend on gracefulness, as is evidenced by many of the photographs in this book. Nevertheless, modern business premises are a vast improvement upon the old, and modern industrial architecture is evidently in its right mind, even if not very well clothed, as yet.

The railway section of the book illustrates signal boxes at Maastricht, Delft,

Dordrecht, and combined restaurants and waiting rooms at the main station at Rotterdam. These are clean-cut buildings, definitely suitable for their purpose. Mr. Bucknell introduces the book with some very sensible remarks, especially when he refers to uninspired copyists who ape the style of innovators, and achieve only a reproduction of apparent superficialities, being "carried away by phrases: Futurism, Functionalism, and a mass of 'critical' comment written in language often almost unintelligible." Our English architects emerge from this book as creditably as any; they at least appear to be desirous of combining some slight suggestion of graciousness with that of Industrial Business Efficiency.

Leitfaden für den Dampflok-motivdienst (Locomotive Service Manual). By Leopold Diederstrasser. 1935. Berlin: Verkehrswissenschaftliche Lehrmittelgesellschaft m.b.H. Deutschen Reichsbahn. 8½ in. × 6 in. × 1 in. 427 pp.; 302 ff. + folding plates. Price 7.15 RM.—This is a book which will delight anyone interested in steam locomotives. Being written for German drivers and those who hope to become drivers, it is of course in the German language, and deals almost exclusively with present-day German practice, but the drawings of locomotives and the isometric and other illustrations of components are so extraordinarily good that a vast amount of information can be acquired even by readers knowing little German. The book can be recommended to anyone specially interested in German practice, while to those for whom it is primarily intended it will be invaluable, for the author deals most thoroughly with the construction and operation of modern German locomotives from the driver's standpoint.

A short historical introduction and an explanation of the designation and marking of German locomotives are followed by notes on the constructional and working materials used. The general arrangement and working of the steam locomotive are then discussed, with a full explanation of the Heusinger valve gear. Each detail of the locomotive is next taken in turn, and its purpose, construction and operation are explained. Reference must again be made to the excellence of the illustrations and the clear naming of every part. Tenders are dealt with in the same manner, and the author proceeds to describe briefly the features of "fireless," rack and pinion, pulverised coal, high-pressure, and turbine locomotives. Brakes are treated very fully, and there is a short chapter on running shed equipment, turntables, coaling, watering and sanding plant, and so on. The duties of the driver and stoker before, during, and after a journey are summarised, notes are given on inspection and repair work, and the book closes with useful

appendices, a remarkable set of folding plates, and an excellent index. The low price of the book bears no relation to the value of its contents nor, we surmise, to the cost of its production.

Fractional Horsepower Motors.—The General Electric Co. Ltd. sends a new illustrated catalogue section, dealing with the Witton range of fractional horsepower motors for industrial and domestic purposes. Various typical applications are shown, including the use of these units to drive a centrifugal pump, a multiple drilling machine, and a portable compressor. For polishing and grinding, a totally enclosed type of motor is supplied in a range of from one-eighth to one horsepower, with emery wheel or polishing mop mounted direct on the armature shaft. A heavy duty 2-h.p. double spindle polisher is also available. As well as a.c. and d.c. types, universal motors are supplied, of outputs as low as ⅛-h.p. The ⅛, ¼, and ½-h.p. motors for a.c., d.c., and universal working can be fitted with silent running reduction gearboxes.

An Adjustable Reamer.—The English Steel Corporation Limited, Openshaw, Manchester, sends an illustrated folder describing the Vickers adjustable reamer, which is now made in an improved design. All sizes are made from ⅝ in. to 6 in. The reamer bodies up to 2 in. diameter are of nickel chrome molybdenum alloy, heat treated to a tensile strength of 60 to 65 tons per sq. in. Cast steel is used for bodies of greater diameter. Tungsten high-speed steel is used for the blades. Owing to the interchangeability of bodies and blades, eight bodies and six sets of blades will accommodate all English and metric sizes from 1 in. to 1⅝ in., while five bodies and eight sets of blades extend the range to all sizes between 2½ in. and 3⅝ in. A micrometer graduation is provided on the reamer end, and is invaluable for setting to size.

P.L.M. Publications.—Thanks to its ramifications in sunny latitudes, the P.L.M. Railway brightens the British winter by the output of much attractive holiday literature. In collaboration with the Southern Railway, the company has this year issued a guide to the Riviera by Mr. Charles Graves, excellently illustrated in photogravure within, and coloured with appropriate brightness without. The vegetation, that is the predominant feature of the covers, seems to have been drawn by a native hand, for it lacks that unfortunate resemblance to an unshaven pumpkin which characterises a recent well-intentioned English interpretation of the local flora. We must not conclude without reference to the many amusing thumbnail sketches with which the eminently readable descriptions, reminiscences, and reflections of Mr. Graves are enlivened. We have also received from the P.L.M. Railway illustrated folders dealing with the French Riviera, Northern and Medieval France, Corsica, North Africa, and winter sports in the French Alps.

THE SCRAP HEAP

DOGS IN GERMAN TRAINS

Travellers on D-trains in Germany may now take their dogs into the compartment with them.

FORCE OF HABIT

"He used to be a railway guard, and has a nasty habit of slamming doors," said a witness at Wood Green Court to-day.—*From the "Star."*

"What's in a name?" asked A of his fellow passenger in an endeavour to wind up a wearisome argument.

"Quite a lot," replied the other, "I always remember a trip I made to Manchester on the old L.N.W.R. We left Euston under 'set fair' conditions—fine weather for a month sort of feeling—but north of Crewe it became overcast and sultry, and before we reached Manchester we ran into a terrific storm. On arrival, I noticed there were two engines on the train; the first one was No. 5522 *Lightning* and the second, No. 5310, *Thunderer*." Well!!

AND TEA FOR TWO?

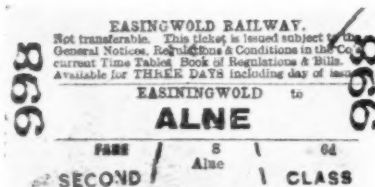
Twenty-four British-built railway engines for North China have armchairs in the cabins for driver and mate. The stoking is mechanical.—*From the "News Chronicle."*

We understand that the seven o'clock train from Liverpool to Manchester on Thursday morning performed its journey of 30 miles in one hour and four minutes, including the stoppage at Newton.—*"A Hundred Years Ago," from "The Sunday Observer" of December 8, 1935.*

TRAVEL TICKETS AS CHRISTMAS PRESENTS

With some relatives, unkind though the suggestion may be, there is perhaps comfort in the thought that it can be a return ticket—even, no doubt, a period excursion. That brings us, naturally (indeed inevitably), to the unkindest and most un-Christmaslike reflection of all. Would it—the question must be delicately put—would it be a perversion of the railway companies' kindly intention if to some relatives were sent tickets not to our homes but to some spot far removed

from us? The spot need not be unpleasant; and, most assuredly, the ticket need not be return! Here, it would seem, is a rare chance for an enterprising hotel manager in some remote place to co-operate with the railway companies and issue an attractive circular in the brief time that remains before Christmas. The thought of all the undesirable relatives grouped around the Christmas hearth of a large hydro in the Highlands is one which would give a rich, satisfying glow to our own festivities. If some hotel manager will adopt the idea we shall all wish him "A Merry Christmas" with quite unaccustomed fervour.—*From "The Yorkshire Post."*



An interesting ticket from the collection of Mr. G. F. Quartermain showing the relatively unusual feature of a misprint in the spelling of the town name from which the railway takes its title

WHAT'S IN A CHIMNEY?

Like the human face, the locomotive chimney can be regarded either as a utilitarian attachment or an index to character. The more fanciful view is taken by Mr. Charles B. Chaney, a contributor to the *Baltimore & Ohio Magazine*, who uses his theory to delineate the virtues and foibles of the company's engines since the 1860's. At that time they were being fitted with a chimney which just failed to achieve real elegance by reason of an uncomely extension to the top of the cap, giving its possessors the air of a suburban Beau Brummel who introduces a touch of the ludicrous into his appearance by wearing a collar too high for his neck.

Removal of this excrescence in the 1880's, and a slight alteration of contour, revealed, to quote Mr. Chaney, "the gay coquette, with twinkling eyes and tantalising ways." A less pleasing

design of the same period had a touch of the snobbish, but engines for heavy passenger and freight duties were blessed with a sturdy yet handsome chimney indicative of the "honest-to-goodness workmanlike fellow who did a he-man's job." Contemporary with all these was "average enterprising business man," represented by a chimney slightly less muscular than the foregoing, but far more pleasing than that of the snob. The underside of the caps of these chimneys of the 1880's was painted a bright red.

In the early 1890's there was a reaction towards simplicity which resulted in the unadorned "stovepipe," to which some may consider Mr. Chaney too kind when he sees in it "the trim athlete who could now qualify for a nudists' camp." Many must have welcomed the reappearance of the capped chimney towards the end of the decade, with the cap now made of polished copper. The same tradition is observed on modern lines in the chimneys of the Baltimore & Ohio's recent lightweight streamlined locomotives, *Lord Baltimore* and *Lady Baltimore*.

It seems to us, however, that it is not only the chimney but the whole front end appearance of a locomotive which gives it character. Even the type of fastening used on the smokebox door is significant. Compare, for example, the jauntiness of G.W.R. locomotives with the sobriety of L.N.W.R. designs. It is surely contributed to by the twin handles of the Great Western locking device, in themselves capable of imparting a variety of expressions according to the position in which they are left after the door is fastened. The hand-wheel and handle of the L.N.W. smokebox door, on the contrary, is a far less temperamental piece of mechanism, and offends against symmetry unless left with the handle pointing straight downwards. Many must feel that the Midland Compound is an uninteresting design because the boss of the smokebox door boasts nothing more than a number plate, while the broad, round "faces" of the "Royal Scots" suggest more brawn than brains. Discussions of this kind are hard to rid of the bias derived from early impressions, and it is interesting to speculate whether the children of future years will continue to be attracted by railway engines, if, as seems probable, their lineaments are concealed behind a smooth, streamlined front-end casing.



Personality in American locomotive chimneys (see remarks above)

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

CHILE

The Proposed Iquique-Oruro Railway

According to information from Santiago, Señor Leopoldo Guillen, Chief of the Railway Department of the Ministry of Production, who recently returned from a preliminary survey trip over the route of the proposed international railway from the Chilean port of Iquique to the Bolivian mining town of Oruro—referred to in THE RAILWAY GAZETTE of September 6, 1935—reports that the present financial and industrial conditions of the country do not justify the building of the railway. He states, however, that the construction of a number of additional branch lines within the Province of Tarapacá would be of benefit to the mining industry. The projected Iquique-Oruro railway has also been opposed in Congress, where it is pointed out that the money required would be spent to better advantage in the construction of new roads in the same Province.

State Railways' Budget

According to advices from Santiago, the forthcoming State Railway budget is expected to amount to at least 350,000,000 pesos (approximately £3,700,000 sterling) in order to meet heavy expenditure on new rolling stock and other equipment, and the increase in the scale of wages. The Chilean railways, like those in other countries, are feeling the adverse effects of road competition, but all efforts to compensate for diminished receipts by reducing the cost of working have been nullified by the continual demands of the staff for higher rates of pay.

ARGENTINA

Institute of Transport Visit to Chile

Some 44 members of the Institute of Transport (Argentine and River Plate Centre) have recently had a most enjoyable and instructive trip to Chile. The only hitch in the arrangements was a delay of three days in Mendoza on the outward journey, heavy falls of snow in the Andean region blocking the 170-km. section of road onwards to the railhead at Los Andes: during the enforced stay at Mendoza some interesting trips were enjoyed.

On arrival at Santiago, the Chilean capital, the party was met by Señor Juan Lagarrigue, Director-General of the Chilean State Railways, who was responsible for the invitation to visit Chile. During the stay in Chile visits were made to the hydro-electric station at Maitenes; the Braden copper mines, 16,000 ft. above sea level and the largest in the world, reached by private

railway from Rancagua; the cavalry school of the Chilean Army; the Alameda and Mapocho stations in Santiago; and also the different headquarters and workshops of the State Railways, where a high state of efficiency was observed in all departments. Visits were paid, moreover, to the picturesque racecourse, and the party was entertained at lunch at the Country Club in Santiago by the Director-General of the Chilean State Railways; General F. Cereceda, the Sub-Director; Señor E. Marfil, Chief of Traction; Señor C. Sotomayor, Chief Engineer; Señor F. Vidal, Chief of the Commercial Department; Señor Arturo Bustos, Chief of Finance and Accountancy; and some thirty other officials. After five days in Santiago, the party left by special train for Valparaiso, where three days were spent, and whence members returned to Buenos Aires. The party was headed by Messrs. John G. Mayne, Chairman of the Centre; G. R. Mawson, Vice-Chairman; and F. C. Egerton, Hon. Secretary, and included representatives of the principal Argentine railways, as may be seen from the illustration on page 1076, prepared from a group photograph taken at the Maitenes hydro-electric station.

River Plate Branch, Institution of Mechanical Engineers

The annual general meeting of the above branch was held in Buenos Aires on November 4. The Chairman, Mr. A. T. Nickson, M.I.Mech.E., M.I.Mar.E., presided. The annual report, which was read, mentioned that during the session the following papers and subjects had been read and discussed:—

"Notes on the Construction and Working of the New Grain Elevators at Bahia Blanca" (Mr. D. C. Bruce).

Paper on "Boiler Feed Water Conditioning" (Mr. A. J. R. Walter).

Paper on "The Modern High-Speed Diesel Engine in Road and Rail Transport with some reference to Transmission Systems" (Mr. R. W. Walker, A.M.I.E.E.).

Discussion on railway tyres and tyre fastenings and superheating.

Notes on "Fluid Transmission" (Major R. K. Hubbard, O.B.E.).

Lecture on "Problems Incidental to Transport Engineering Undertakings" (Mr. W. F. Nixon).

Visits were paid to the B.A. Great Southern grain elevators at Bahia Blanca and Ingeniero White, and to the shipyard of the Argentine Navigation Company.

The following committee was elected for 1936: Messrs. J. W. H. Rea (C.M.E., B.A.G.S. & B.A.W.R.), Chairman; D. S. Purdom (Hon. Sec.); P. C. Dewhurst (C.M.E., Central Uruguay Railway), W. H. T. Harvey, R. K. Hubbard (Stores Supt. C.A.R.), and S. H. Pinsent. A vote of thanks to the retiring chairman and the honorary secretary (Mr. W. H. T.

Harvey) for their services was proposed and passed.

Central of Buenos Aires Railway

Government has approved of the scheme proposed by the Terminal Central of Buenos Aires Railway, for amalgamating their administrative expenses with those of the Central of Buenos Aires, the Lacroze Tramway and the Lacroze Light and Power Companies, in order to effect economies in overhead charges. It is stated that the measures to be adopted by these companies are based on the amalgamation of the offices and co-ordination of services effected by the B.A. Great Southern and B.A. Western Railways, which have already received the approval of the Government.

NEW ZEALAND

Record Traffic on New Line

Full loads are being carried by all goods trains on the new Stratford main trunk line (connecting Taranaki with Auckland) and additional trains are having to be put on. Passenger traffic on the slow trains remains fairly constant but the New Plymouth-Auckland express is being well patronised by residents of Stratford and district. The express carries about 100 passengers on every journey.

Suburban Traffic Monopoly Granted

Under an Act just passed, a monopoly of passenger transport in the residential areas of the Ngaio, Khandallah, and Johnsonville suburban districts of Wellington, is granted to the Government Railways Board. These districts cover the hilly area extending ten miles out from Wellington on the old main trunk route, which will become a purely suburban line when the Wellington-Tawa Flat deviation is completed. Justification for the monopoly has been admitted by all interested parties, and compensation for road carriers working under existing licences has been settled mutually. It is understood that this includes purchase of the plant but not payment of goodwill. An obligation is imposed on the board to provide adequate means of transport for the district, if not by railway, then by road vehicles licensed under the Transport Licensing Act. So long as the board fulfils its obligation to provide adequate means of passenger transport, no other licence will be granted to cover this area except with the consent of the board.

Powers of Licensing Authority

If the Railways Board fails to maintain an adequate service, the appropriate licensing authority under the Transport Licensing Act may issue to any person a licence to carry on passenger services within the area between the suburban districts and Wellington. Any questions of fact that may arise are to be determined by the Transport Co-ordination Board, and it will also consider complaints of non-compliance,

but only if these are signed by not fewer than 50 adult residents of the locality in respect of which the complaint arises.

The Railways Board is of opinion that, as the railway line effectually taps the residential areas, and as the main omnibus routes are close to the line, there will be no justification in the event of the electrification of the line, for the continued operation of road transport services except as feeders to the railway.

UNITED STATES

Improvements in Freight Traffic

Freight car loadings, having attained a seasonal peak of 734,000 in the week ended October 12, have since been receding, but the weekly totals continue to be well above those of last year. For the week ended November 2, 681,000 cars were loaded, or 68,000 more than in the corresponding week of 1934.

The improved traffics have been reflected in better earnings. The Class I railroads in September had gross revenues of £63,392,000, an improvement of over 11 per cent. compared with last year. Operating expenses, £43,608,000, were greater by over 7 per cent. than in September, 1934. Net railway operating income (after taxes but prior to rentals and interest on bonds) was £11,472,000—an increase of no less than 37 per cent. Preliminary totals for a few railways indicate that October earnings should show even greater improvement than those of September.

Collection and Delivery Nation-Wide

At the recent meeting of the "member roads" of the Association of American Railroads, it was decided to extend collection and delivery services of less-than-carload freight to all sections of the country. Heretofore, the services have been introduced piecemeal, one company or one section at a time. The troublesome matter of what rates shall be charged for "l.c.l." is still in abeyance, since the Interstate Commerce Commission has again postponed, from December 1 until January 15, the date when motor carriers must file their rates under the new regulatory law. The railways, quite naturally, wish to see what rates their competitors propose before they make wholesale revisions in their tariffs.

FRANCE

New Rolling Stock for 1936

The 1936 budget has recently been approved by the Conseil Supérieur des Chemins de Fer at a meeting held at the Ministry of Public Works. In view of the current deficit of the Common Fund due to the continued operating losses of all the railway systems, the council cut the proposed expenditure down to a minimum, though no reduction was made in the

credits considered essential for safety in operating the lines. The estimates include new rolling stock costing fr. 412,400,000 against fr. 474,700,000 in 1935.

Locomotives, Railcars and Coaches

Details of the programme include orders for experimental steam and high-speed electric locomotives, shunting tractors and railcars, of which a total of 170 are budgeted for. The distribution of the railcars is: Est, 30; Etat, 40; Nord, 20; Midi, 10; P.O., 20; and P.L.M., 50. They are of several different types.

The railways in 1936 will order 400 coaches for main line traffic, to be distributed between: the Alsace-Lorraine (30), Est (70), Etat (40), Midi (20), Nord (20), P.O. (30), and P.L.M. (50). The remaining 140 will be for suburban traffic, and will cost fr. 59,500,000. Of these the Est intends to order 100 and the P.L.M. will acquire 36 to make up four push-and-pull trains for rush-hour traffic. The remaining four steel vehicles are for the Nord, for its Gennevilliers line. The price of main line coaches has been uniformly reduced to fr. 450,000, and suburban coaches to fr. 425,000.

Large Order for Containers

Orders for 175 steel vans were originally in the programme, including 50 each for the Etat, P.O., and P.L.M., and 25 for the Midi, but the number was reduced to 145, as the P.L.M. has postponed orders for 30 vans: the total cost of the vans will be fr. 14,100,000. Container traffic will be developed in 1936 and the railways are now considering the placing of an order for 5,000 at a cost of fr. 22,055,000.

SPAIN

New Railway Law

On November 27 the Minister of Public Works read before Congress the draft of a new Railway Bill, and its text was published in the *Madrid Gazette* of November 28. Since the parliamentary commission reported and submitted the draft described in THE RAILWAY GAZETTE of November 15, some alterations have been made in the text, but its general outline is unaltered. One of the principal alterations made by the Government in the original draft is that the claims of the companies for the amounts due to them under the operation of the Statute of 1924 are now—after being agreed and approved by all the numerous bodies which compose the cumbersome State machinery for controlling the disbursements of the national exchequer—to go to the Cortes for final sanction. It appears that at the best something like fifteen months must transpire after the presentation of any claim, before there can be any possibility of a settlement, a very discouraging prospect for some of the smaller companies, which have not been allowed to reduce staff or to lower the wages guaranteed by the

Government in 1920. The proposal contained in the original draft of the new Bill for the modification of the eight hour day has been deleted in the final text, as has the proposed reduction to 10 per cent. of the 25 per cent. tax on passengers.

In some ways the preamble to this Bill is more interesting than the Bill itself. The preamble refers quite clearly to the prevailing opinion in favour of some form of nationalisation, preferably to be carried into effect by the State anticipating the 99 years reversion of all the concessions (the majority of which have some thirty years to run), and immediately leasing the whole as a complete system, to private enterprise, or to a corporation. The preamble goes on to say that for three main reasons the Government has decided that the moment has not yet arrived for such a radical step; the reasons are: (1) due to the difficulty of arriving at an equitable valuation at the present time of acute depression; (2) because of the possibility that the position of the railways is due to archaic regulations and unbridled road competition, and (3) owing to the present state of the national exchequer.

The Railway Companies Association is arranging to hold a meeting in Madrid to formulate certain amendments which it is hoped to get inserted in the Bill either in Committee or in the debate. There is, however, little likelihood of the project coming up for debate in Congress until the estimates have been approved.

Impressions of Spanish Travel

A visitor to Spain recently gave the following as his impressions: One of the first things to strike him was the exemplary punctuality of the main line trains and of most of the locals, too. A reason for the fast running of the Sud Express over the P.O.-Midi in France is frequently given as the late handing over of the train at the frontier, but in fact it is the frontier formalities that cause most of the delay. The Norte 4-8-2 compound engines are now worked far below their capacity, for the day trains load only to 290-320 tons gross and the night expresses to about 350 tons. The long grades and frequent curves make the overall speeds low, and the time for the 393 miles between Madrid and the French frontier at Hendaye is 10½ to 11¼ hr. Some new high-speed diesel trains are being built, and two of them will take over the Sud Express service on a timing of about 8½ hr. The main line trains are hauled by an electric locomotive (usually 7600 class of 2-6-6-2) from the frontier to Alsasua, 63¼ miles, and thence to Madrid by the Mountain type engines, one from Alsasua to Miranda, another from Miranda to Valladolid, and a third from Valladolid to Madrid. The loading on the M.Z.A. is similar to that on the Norte, but the night express from Madrid to Barcelona never loads to less than 330 tons tare and carries a large quantity

of mails. Out of Barcelona (M.Z.A.) one of the heaviest trains is that leaving at 14.43 with through carriages for Zaragoza, Madrid, and Valencia—the latter going off at San Vicente—which loads up to 390-400 tons, and like all the principal M.Z.A. trains (except those from Barcelona to Port Bou) is worked by a two-cylinder simple Mountain type engine. The 4-8-0 type is favoured for the line to the Port Bou-Cerbère frontier. The permanent way on the Norte and M.Z.A. main lines has rather a neglected and grass-grown appearance, except for a notable stretch from Burgos to Venta de Banos on the Norte, which has the standard 12.5 m. (41 ft.) 86 lb. per yd. flat-bottomed rails and is in first class condition. On the M.Z.A. the standard rail is 12 m. (39 ft. 4 in.) long and 80 lb. per yd. in weight, but 91 lb. rails are used to some extent. Colour-light automatic block signalling is installed on the Norte between Madrid and Villalba, and between Miranda and Medina del Campo the station signals are of the controlled colour-light pattern. The Norte main line stock rides well, but

that cannot be said of the M.Z.A. Speeds rarely exceed 100 km.p.h. (62 m.p.h.), but as in England this is a matter of the driver's judgment, for speedometers are not normally fitted in the cabs. The M.Z.A. has a most heterogeneous collection of engines, even at its main shed in Madrid. The 4-8-2 tender and 4-8-4 tank types were all Spanish-built in post-war years, but there are Spanish and German built 4-8-0 classes; Henschel and Maffei 0-8-0; American Locomotive Company Pacifics built in 1916-17; Maffei Pacifics; Henschel, Maffei, and Hanomag compound 4-6-0; Henschel, and Maffei 4-6-4 tanks; Henschel, and Soc. Alsacienne outside cylinder 0-6-0 (1888); Sharp Stewart 2-4-0 (1889); and Sharp Stewart 0-4-2 built in 1876.

MANCHUKUO

Drastic Economies Foreshadowed

Mr. Matsuoka, the new President of the S.M.R., has lost no time in signalling his appointment by the institution of far-reaching measures of

economy. In the face of Y.89,000,000 demanded by the various departments, and a proposed budget allotment of Y.76,000,000, he has cut down the actual appropriation for 1936 to Y.36,000,000. A sum of Y.37,000,000 has also been allotted for Manchukuo State lines. These figures now require the approval of the Japanese Government. Mr. Matsuoka anticipates an S.M.R. profit of Y.50,000,000, or 8 per cent. next year.

General Reorganisation

Coupled with these extensive economies, is the reorganisation of the whole system now controlled by the S.M.R., including the State lines. A general headquarters is likely to be established at Mukden, and, as already anticipated in these columns, the Directorate-General of the State system seems almost certain to be abolished. Part and parcel of the scheme is the reorganisation of the North Korea (Chosen) Railway.

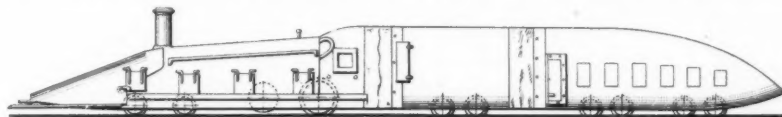
The number of employees of the South Manchuria Railways, including the Manchukuo State Railways, which are operated by the S.M.R., is 174,000.

Streamlining Seventy Years Ago

By R. E. WOLSELEY

On August 8, 1865, the U.S.A. patent office issued to Samuel R. Calthorp, of Roxbury, Mass., Patent No. 49,227, for an "Improvement in

parts of the engine itself; second, the back pressure on the piston of the steam which is forced through the blast-pipe; third, the resistance occasioned



construction of railway trains and cars." Today we would call it streamlining. He therefore introduced the technique twenty-eight years before Mr. F. U. Adams, whose streamline scheme was illustrated on page 929 of THE RAILWAY GAZETTE of May 25, 1934.

The object of his invention, Mr. Calthorp declared, was to "diminish atmospheric resistance." There is probably no more frequently used phrase in the literature and conversation of transport experts today than "diminishing wind resistance." Written with the clarity and accuracy of the modern engineers who design such trains as the Burlington Zephyr, the streamline train of the Union Pacific, the Zeppelin, and other modernistic units, Mr. Calthorp explained what he called the "chief resistances opposed to the progress of a railway train." He asserted in his patent application that such resistances arise from the following causes:—

"First," he declared, "the friction of the machinery, which includes the friction of the wheels in their boxes, that of their surfaces bearing upon the rails, and the friction of the working

by the passage of the train through the atmosphere.

"It is now known beyond doubt that at high speeds the atmospheric (sic) constitutes the chief portion of these resistances, and that in very high rates of speed it becomes so enormous that the power required to overcome it cannot be generated except at very great cost.

"To diminish this atmospheric resistance is the object of my invention, which consists in regarding the whole train as an aerial ship and modelling its whole surface in accordance with the principles so successfully applied to shipbuilding, modified, however, by the consideration, first, that the railway-train is wholly immersed in the fluid through which it is passing; second, that while running on a fixed track it has to meet winds blowing from all quarters; and, third, that the bottom of the train is always near the ground, and therefore a too great proportion of air should not be forced into the confined space below the train."

To which the modern Calthorps would certainly say "aye." Nor would they disapprove of his application of

his theories, for they have done substantially the same in a manner that would make the earlier inventor happy to see the realisation of his ideas. After giving a detailed description of the changes he would make on the trains of his day, Mr. Calthorp summed up his suggestions in this way:—

"(1) Giving to the exterior surface of a railway train a form tapering from the centre of the train toward either end, or tapering the engine or car at the front or rear of the train, for the purpose of diminishing the atmospheric resistance.

(2) Constructing the engine and its truck with a projection in front, in its several parts of the shape substantially as set forth, and incasing its body, both above and below . . . and rounding its cab, so that its projection and main casing (while protecting its own surface from the direct resistance of the wind) may, together with its rounded cab, form a single prow to the whole of the train. . . .

(3) Placing a false bottom, substantially as described, under each carriage of the train, for the purpose of protecting the trucks and other projecting surfaces under the carriages from the adverse action of the wind.

(4) Inclosing the whole space between any two contiguous carriages of the train flush with the sides, top, and bottom of said carriages by means of the false bottom aforesaid (which is extended under the platform), in combination with the projecting roof already in use and a flexible hood or hoods. . . ."

Nowhere did the inventor use the word streamlining, for it had not then been made a part of the English language.

NEW NORD CARRIAGE INSPECTION SIDINGS IN PARIS

THE formation and inspection sidings for main line and a few suburban trains, serving the Gare du Nord, Paris, at Le Landy, a short distance from the terminus, have recently been completely re-modelled. The number of trains dealt with daily varies from 50 to 65. The new layout comprises 4 groups of sidings, namely, 10 reception lines, 6 of which have examination pits; 8 marshalling lines, 9 inspection and maintenance lines, all provided with pits; and 24 storage sidings, arranged herring-bone fashion. Each reception line is provided with inspection pits and platforms (Fig. 1) 260 m. (853 ft.) long. Concrete construction is used throughout.

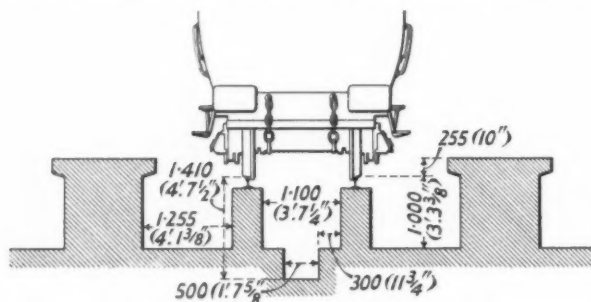


Fig. 1—Cross-section of inspection pits

and the rails over the inspection pits are welded end to end. Special attention has been paid to lighting, 25-W. lamps being placed at frequent intervals in bulkhead fittings, providing a powerful illumination of every part of the underside of the train. After leaving the reception lines, the vehicles pass to the inspection lines proper, which have similar pits, although varying in certain dimensions. There are three subways for the staff to pass from one line to another, and in these are run the air and steam mains. Compressed air, steam, and water supplies are available at numerous points, and three sets of electric mains at different voltages provide for accumulator charging, portable tools, vacuum cleaners, and for testing electric light and control circuits—for reversible working—on the trains.

Every convenience has been provided for the staff, including shower baths, rest rooms, and dining rooms. There is also a workshop and stores, with offices for the contractors who undertake the cleaning of the trains. The whole yard is floodlighted at night. A mechanically-fired heating plant, burning coal dust, provided for the train heating in winter.

Two new signal-boxes, containing both route-lever and individual lever apparatus of the M.D.M. pattern, have

been erected. All signals are of the colour-light single lens type, the positions of which, as well as of the points, are repeated on cabin diagrams. In order to protect the staff working in the different lines, special apparatus has been put in to indicate the occupation of the lines and enable those working there to control the clearing of the respective signals. Certain points can also be held locked to act as traps protecting the line concerned. Tractors are used for hauling odd sets of vehicles.

Working of the Yard

Empty trains are brought from the Nord terminus by shunting engines, the regular train engine assisting. On arriving in the reception group of lines, the latter locomotive returns to the depot, while the former is used to take a new empty train into the terminus. The arriving train is then examined by a principal examiner, three assistants,

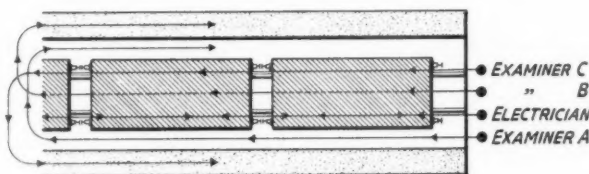


Fig. 2—Routine of examination

and an electrician, who make their rounds as shown in Fig. 2. The principal examiner hands special forms to his subordinates, who later return them to him filled in. He then passes them on to the supervisor of train movements.

When no vehicle is ordered to be detached for repairs, the train passes to the regular maintenance group of lines; otherwise a shunting locomotive brings the set to the classification sidings, where any defective vehicle is taken out. The supervisor makes out the necessary repair sheets and passes them to the foreman maintainer, who has then to divide the work among the men concerned. Spare parts and tools are brought from stores, on requisition, by an electric truck. When the foreman is satisfied that the work is complete, he cancels the occupation of the line and the train is handed to the Traffic Department.

About 20 trains are dealt with every 8 hours. A special card index system enables the condition of each vehicle to be followed, and the new system of organisation has enabled the amount of writing done by the technical staff to be greatly reduced. The yard was opened on November 20, 1934, and the results obtained are stated to be very satisfactory. A full description is contained in the *Revue Générale des Chemins de Fer* for August, 1935.

Travel and Industrial Development Association

The Prince of Wales, who is Patron of the Travel and Industrial Development Association of Great Britain and Ireland, spoke at the annual general meeting of the Association on December 10. He said that its work might be described by a term borrowed from the cinema, in that it consisted in the projection of this country on the world's screen. The Association deserved every possible kind of support to assist it in raising its voice louder and louder in praise of the many things Great Britain had to sell. These included picturesque

traditions and a lovely countryside, vigorous industries, and extensive sporting facilities for participants and spectators.

Overseas tourists responding to the appeal of these attractions had spent £25,000,000 in this country in 1934, which was not far behind the £28,000,000 we obtained from the sale of wool, or the £31,000,000 from coal. Moreover, that tourist expenditure benefited all our industries. The national projection to which he had already referred, the Prince concluded,

was dependent upon national co-operation, and he was glad to see that over 300 local authorities, over 800 hotels, and many business houses, had followed the example of the railway and shipping companies in supporting the Association.

Lord Derby moved the adoption of the annual report, and Captain Evan Wallace, Secretary of the Board of Trade, seconded. The motion was carried. Further reference to the activities of the Association is made in an editorial article on page 1052.

MACHINING OF RAILWAY WHEELS AND TYRES

III—Design and operation of wheel lathes and vertical boring machines

By C. D. ANDREW, M.I.Mech.E.

TO continue with the consideration of the elements of wheel lathe construction,* it is appropriate to call attention to the methods employed for actuating the feed traverse of the cutting tools. There are two methods in use, viz.: the intermittent or ratchet feed, and the continuous feed.

The ratchet feed is in common use in this country and abroad, and has generally been the standard method of machine tool makers on account of its simplicity and suitability for operations on mounted sets of wheels. Although its action is intermittent, it is practicable to provide so many engagements of the ratchet pawl per revolution of the faceplate that the result approaches sufficiently near to that of a continuous feed, and the consequent additional stress of intermittent action upon the traverse screw and nut is almost negligible, provided that the proportions of these parts are sufficiently ample. The traverse across the tread of the tyre is operated by a ratchet-box attached to the traverse screw and fitted with a trigger convenient to the hand of the operator, and which can be easily shifted by finger pressure to three positions, *i.e.*, forward, reverse, or neutral, at any point between the picks of the ratchet.

Assuming the rate of feed to be $\frac{1}{8}$ in., or $\frac{3}{8}$ in. per revolution of the faceplate, which is commonly used, the advantage of the finger trigger is noticeable, particularly when the tool is beginning to cut into the root of the flange, as the feed can be thrown quickly to the neutral position, thus avoiding too heavy a cut, and the trigger can then be manipulated by hand to shape the root without overloading the tool. In combination with push-button control of the main motor, operated by buttons located on the slide rest, and by means of which the machine can be slowed down or stopped and re-started, it is possible to deal effectively with hard spots and flange forming safely and with the minimum loss of time.

Operations on Tyres

There are two different types of machine for turning and boring operations on tyres, the horizontal and vertical designs. For wagons, coach, and bogie wheel tyres, the vertical type in which the tyre is chucked on a horizontal table and operated upon by tool bars has generally been favoured in America and on the continent of Europe, while in this country both horizontal and vertical types are in common use. The horizontal machine (*i.e.*, that in which the faceplate is vertical) has several points in its favour for these small diameter tyres, namely:—

1.—Solid support down to foundation level is provided for the saddles (as compared with the uprights and cross slide of the vertical machine, which means heavier construction to ensure equal rigidity at the tools).

2.—The chips fall away from the work more freely than in the vertical type as ordinarily designed, and can be cleared away more readily.

3.—There is no tendency to distortion when chucking these small tyres in a vertical position, such as is sometimes noticeable in tyres of large diameter, when so chucked.

An apparent disadvantage, though not in practice of any real importance, is that the dead weight of the main spindle, faceplate, and tyre comes upon the lower half of the spindle bearing, as in other types of chucking lathes.

A possible drawback is that the crossbed and saddles of the horizontal type project in front of the work, whereas in the vertical machine the saddles are out of the operator's way and he can stand close up to the work.

The two salient points in favour of the horizontal type for small tyres, particularly in view of the high cutting speeds now obtainable, are the easier clearance of chips and the less expensive design.

So far as loading and unloading of the work is concerned, there is no particular choice as between the vertical and horizontal machines. Therefore it appears that for the smaller sizes of tyres, the horizontal machine with vertical faceplate is the better type.

The above remarks are based upon the usual design so far as concerns the vertical machine, but it would appear that a practicable modification of the design of the table and spindle of this type (vertical tyre boring mill) could be universally adopted, which would allow of the easy and continuous clearance of cuttings through the main spindle.

Such a method is already in use to a certain extent, and in this connection it is of interest to note that in collaboration with Mr. W. A. Stanier, Chief Mechanical Engineer of the L.M.S.R., a new and improved design of vertical tyre boring machine (8 ft. diameter) is being developed by certain English makers, the machine in question to be provided with a hole of ample diameter through the main spindle. To protect the walls of the bore from abrasion by cuttings, a detachable liner is provided. The chips will pass through the hollow spindle to a chute which will carry them to a receptacle in the front of the machine, below the floor level.

The following points should be mentioned in connection with this new design. It is common practice to use in such machines, when intended for tyre boring only, a cross slide fixed to the uprights, headroom being limited, therefore, by the extent of vertical movement provided to the tool bars, but although this is a simple and rigid construction it has certain disadvantages. In the new design, the cross slide will be arranged for raising or lowering on the uprights, as in the ordinary vertical boring and turning mill. Thus the slide can be brought down quickly to support the tool bars as close up to the work as may be found convenient, or it may be elevated well out of the way for easy loading and removal. At the same time, the machine becomes of a more universal character, permitting it to be used for other work than tyres, in the event of the shop programme making this desirable.

In this connection, and having in mind the needs of certain railway shops, particularly abroad, where the output of new tyres is limited, it occurs to the writer to suggest that in such cases the centre part of the table of the hollow spindle mill might be recessed to receive when desired a detachable filling-up piece or spider, with a 4-in. dia. pilot bore.

In the new design above referred to, the method of machining the retaining ring groove in the tyre will call for special attention, due to the almost universal use of the retaining ring in locomotive tyres having replaced the riveting or studding methods for securing the tyre to the wheel centre. Machines have been constructed abroad in which a separate head is employed for the ring groove, and

* Former articles in this series appeared in our issues of February 15 and March 1 this year.

while this is quite practicable, it adds appreciably to the gear mounted upon the cross slide and restricts the lateral movement of the boring heads.

A method of grooving employed in one of the French railway shops some years ago was to attach a small tool rest to the right hand boring bar, the grooving tool being fed in by hand. American makers later attached a light supplementary head carrying a tool rest operated automatically.

Another method, employed by Sir W. G. Armstrong Whitworth & Co. Ltd., with a view to restricting the number of saddles or heads to two, was a horizontal type of machine fitted with two rigid boring bars, placing beneath or behind the main boring bar a separate grooving mechanism consisting of a transverse grooving tool slide operated by cam action from the mainbar in its forward travel. It is proposed in the new design to adopt a different method, while employing two saddles only, and it will be possible at a later date to give particulars and illustrations of the accepted design.

Mention should be made of duplex machines for small tyres. These have sometimes taken the general form of a wheel lathe design, the reason for this being that two tyres face to face can be dealt with by a single operator, but since the speed of boring operations has been greatly increased, the work of the operator is now more economically confined to a single tyre. This fact has led to the increased use of a form of the horizontal machine in which a single headstock is fitted with two faceplates, one on each side of the headstock, the intention being economy in construction as well as in the floor space occupied.

When the boring and facing of locomotive tyres of the larger diameters are to be considered, it is evident that the vertical machine (with horizontal faceplate) is the most suitable type for the purpose. A deep and rigid section is necessary for the faceplate or table, as well as a large diameter main spindle, involving considerable dead weight, and in comparison with the horizontal machine, in which the saddles receive the direct support of the foundations, the converse is true of the vertical machine for boring large tyres, in which it is more important to provide this direct support underneath the table and thus maintain alignment. This design also allows of more than one method of easing the weight of the table upon its bearings, when it is desired to run at high speeds.

This result is usually obtained either by an oil film under pressure, or by a mechanical counterbalance such as has been provided by the use of multiple levers acting vertically upon the footstep bearing of the main spindle in conjunction with a steelyard.

Developments in detail of these machines which have been made during the past two decades include:—

- 1.—Safety slipping clutches to disengage the feed in the event of overload or obstruction.
- 2.—Graduated scales on the cross slide to permit quick positioning of the saddles, to suit varying diameters of tyres.
- 3.—Quick power traverse of the saddles along the cross rail, also vertically to the tool bars, if desired.
- 4.—Adjustment of the traverse of the saddles by hand levers to give fine finishing cuts.
- 5.—Inclined faces to the chuck jaws (1 in 20) and vertical serrations to the jaws instead of horizontal as formerly, since on heavy cuts the latter had insufficient grip.
- 6.—The use of three self-centring chuck jaws on the table, to bring the tyre into position, combined with the use of three independent jaws to assist in securing a rigid grip.

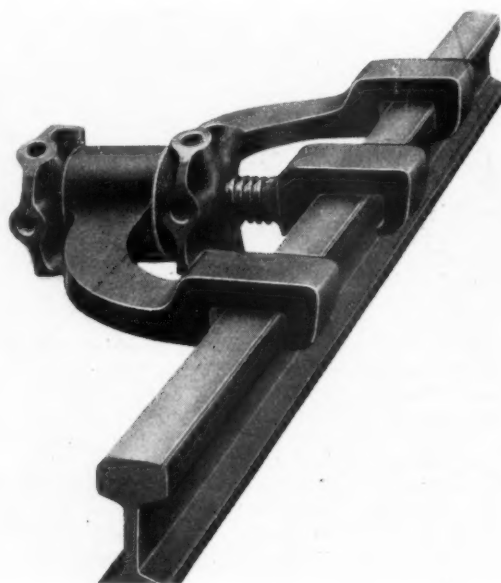
The combination of Nos. 5 and 6 was used in the first instance by Taylor Bros. & Co. in the firm's Trafford Park Works, in order to allow of heavy roughing cuts and the use of a forming blade upon the flange of tyres. So far as the writer's experience goes, flange forming on the tyre borer has been done only in the case of tyres for

export to railways abroad. Self-centering chucks have the additional advantage that they ensure equal pressure on three points, and thus obviate the distortion of large diameter tyres which is possible when the jaws are independent only.

There has been some divergence of opinion as to whether it is proper practice to machine the face of tyres, and possibly rough out the flange, while the work is set up in the tyre mill. With the rigid and powerful design now obtainable, it is however, quite practicable to use a blade tool on the flange for roughing out if desired. Also, owing to the greater accuracy of tyre mill and wheel lathe, it is quite permissible to machine the face of tyre sufficiently to leave a small margin only for finishing on the wheel lathe (say 0.030 in.). It is then necessary to use in the wheel lathe only a broad blade tool secured in the front rests, to finish the width between tyres to the pin gauge, before starting cuts upon the profile.

A Two-way Jimcrow

ON lines electrified with the third rail the use of the ordinary jimcrow is severely restricted and cannot be used, unless the current is cut off except in one direction. Even then, with the conductor rail barely a foot away from the running rail, it cannot be really effectively used. A jimcrow that will work either way is therefore of great advantage, and such a tool has recently been



introduced by the P. & M. Co. (England) Ltd., and is illustrated herewith. This tool is different from the ordinary one-way jimcrow in being of a different class of material and fitted with ball races. It is forged from a high quality hammered steel, in contrast to the ordinary mild steel used for a one-way crow. The blow is accurately bored out to take ball thrust bearings. The screw is also accurately turned and cut, and both the screw and the bow are carefully lined up square with the rail. The claws are machined. These tools are now in extensive use on one of the British main line railways, where we understand they have proved their utility especially on electrified lines.

FIFTY YEARS OF RAILWAYS IN MALAYA, 1885-1935

The jubilee of railways in Malaya has been signalled by the issue of a handsome brochure summarising developments on this progressive system during the past half century

THE opening for traffic of the first railway in Malaya, from Port Weld to Taiping, on June 1, 1885, has provided the occasion for the issue this year of an illustrated brochure on art paper under the above title. It consists of eighteen chapters covering the history of all the railways in the Peninsula and their varied activities. The origin of the present system, known as the Federated Malay States Railways, was a group of four isolated lines linking the chief towns in the different States with the coast. Thus, in Perak, Taiping was linked with Port Weld in 1885 by a railway 8 miles in length; in Selangor the capital (Kuala Lumpur) was connected with Klang by a railway of 21½ miles on September 15, 1886; and Seremban in the State of Negri Sembilan (formerly Sungei Ujong) was linked up with Port Dickson by a railway of 24½ miles in July, 1931.

The first section (17 miles) from the port of Teluk Anson in Perak was completed in 1893 to Tapah Road, which is situated on the present main line between Prai and Singapore, but the link of 32½ miles thence northwards to Ipoh was not opened throughout until 1895. These early railways in Perak and Selangor were owned and operated by the respective Governments of those States, and, with the exception of the line between Tapah Road and Ipoh, were built under contract. The original contract for this section was, however, cancelled in 1893, and from that date onwards all railway construction in the Malay Peninsula has been carried out departmentally, or at piece work rates under the supervision of railway engineers. The Seremban - Port Dickson line was built and owned by the Sungei Ujong Railway Co. Ltd., which worked it independently of the Government for many years. It was subsequently taken over by the Federated Malay States system in 1908. This line and the Taiping-Port Weld line are now used for goods traffic only.

The development of railway construction in Malaya is diagrammatically shown on page 2 of the brochure in a series of six maps which indicate the lines open in 1890, 1900, 1910, 1920, 1930, and 1935. By 1890 only 29½ miles had been opened; in the period 1890-1899 a further 195 miles were opened, mostly in isolated sections but including short lines north and south of Kuala Lumpur; in 1900-1909 the length of new line opened was 384½ miles; in 1909-1919 338½ additional miles were opened;

and during the period 1920-1932 167 miles were added, exclusive of duplications and deviations. No fresh extensions have been made since 1932, and owing to road competition two branches have been closed, namely between Connaught Bridge Junction and Kuala Selangor, and the Bahau-Kuala Pilah branch from the East Coast line. In many ways the Governments of Perak and Selangor co-operated in the planning of railways destined to form part of the main (west coast) line, and in 1901 the railways of those States were amalgamated under the style of "The Federated Malay States Railways," operated by one administration.

The first section in Province Wellesley was opened from Prai to Bukit Mertajam in 1899, and the railways in that



Map of the Federated Malay States Railways

province were connected up with the Perak railways in 1902, and in 1903 through railway communication was established between Prai and the main system running southwards through Perak and Selangor to Seremban in Negri Sembilan. In January, 1903, the railway of 17 miles in the Island of Singapore was opened, but then had no railway connection with the mainland. It was taken over by the Federated Malay States Railways on January 1, 1912. From Seremban the railway was carried further south through Tampin to Gemas in 1906. South of Gemas the territory of the Sultan of Johore was entered, and the Sultan's railway of 121 miles through that territory to Johore Bahru opposite Singapore was opened in 1909, and is worked by the Federated Malay States Railways Administration under lease. At Johore Bahru connection was provided with the Singapore Railway by means of ferry steamers, and by this means, the Island of Penang, which was connected by ferry steamers with the mainland at Prai, was given through communication with Singapore. The Johore causeway, which joins the island of Singapore with the mainland, was used by the first goods train on September 17, 1923.

North of Bukit Mertajam Junction in Province Wellesley on the main line the railway has been extended for a distance of 99 miles through Kedah and Perlis to the Siamese border at Padang Besar where junction is made with the Royal State Railways of Siam, at a point 580 miles from Singapore. Construction was begun in 1912 and the Siamese border was reached on March 1, 1918. A through bi-weekly service was started on July 1, 1918, between Penang and Bangkok.

The East Coast Railway leaves the main line at Gemas 137 miles from Singapore and runs in a northerly direction through Kuala Lipis in Pahang to Tumpat in Kelantan, a distance of 327½ miles. Construction from the Gemas end was begun late in 1907 and the first section from Gemas to Bahau including a branch (now closed) from Bahau to Kuala Pilah was opened in April, 1910. Further extensions were opened from time to time until in 1913 Tembeling 117½ miles from Gemas was reached. Meanwhile in 1912 construction was begun at Tumpat working south and a section of 32 miles from Tumpat to Tanah Merah was opened in 1914, and in the following year a small branch of 1½ miles was opened from Tanah Merah to Riverside on the Kelantan River. During the war construction slowed down considerably on the south section and was suspended in Kelantan. In October, 1917, the line of 24½ miles from Tembeling to Kuala Lipis was opened to traffic, thus linking up the administrative capital of Pahang with the railway system.

Construction in Kelantan recommenced during 1918, work being at first concentrated on the branch of 11½ miles from Pasir Mas to Sungei Golok on the Kelantan-Siam frontier to join up with the Siamese Railways. This branch was opened on September 1, 1920, thus giving Kelantan rail communication with the rest of the peninsula via the Siamese Railways to Padang Besar. During 1920 work was begun on the Guillemard bridge over the Kelantan River near Tanah Merah, and the bridge was opened for traffic in 1924. This is the longest bridge in the Peninsula and consists of 5 spans of 250 ft. each and 5 spans of 150 ft. each. The line of 20½ miles from Tanah Merah to Krai was also opened in 1924. Meanwhile, construction was proceeding from the south and the sections of 43 miles from Kuala Lipis to Merapoh, the boundary between Pahang and Kelantan, were completed and opened throughout in 1927. In the same year a further section in Kelantan from Krai to Manek Urai (10½ miles) was opened. This section is very heavy and owing to difficulties in transport, progress was necessarily slow. The highest known flood, which occurred in Decem-

ber, 1926, caused a great deal of damage to the construction works and rendered necessary a considerable deviation in the original line between Kuala Gris and Kuala Pergau involving heavier tunnelling and additional expenditure. There are nine tunnels on the East Coast Railway of which eight are in Kelantan, and their total length is 7,704 ft. The East Coast Railway was completed on September 5, 1931. The latest railway construction work carried out by the Federated Malay States Railways since that date has been the deviation of 8½ miles in Singapore, which was opened on May 3, 1932.

The total route mileage of the system is now 1,067, with a total track mileage of 1,321, all of metre gauge. The railway has been constructed to a high standard and, except on the Taiping Pass section of 25 miles, has a maximum gradient of 1 in 100. The main line and Port Swettenham branch are laid with rails of 80 lb. per yard, and the remaining sections with 60 lb. rails. Sleepers of local hardwood are used. There are 213 permanent stations and 76 halts. The railways own 178 locomotives and rail motors, 397 passenger coaches, 1,570 goods vehicles, 11 steam vessels and 80 lighters. They also operate road services.

The headquarters of the system are at Kuala Lumpur, the capital of the Federated Malay States. At Sentul, three miles north of Kuala Lumpur are the central workshops. For operating and commercial purposes the railways are divided into two divisions, Kuala Lumpur and lines north and west thereof forming the Western Division with headquarters at Kuala Lumpur, whilst lines south and east of Kuala Lumpur form the Midland Division with headquarters at Gemas. The staff of the railways, which in 1929 totalled 25,000, has now been reduced to 11,643 in consequence of the cessation of new construction, reorganisation and reduction in traffic.

The line was doubled between Prai and Bukit Mertajam in 1917 in order to cope with the increased traffic to Kedah and Siam consequent on the opening of through traffic with Bangkok. In 1924 and 1925 doubling was carried out between Kuala Lumpur and Batu Junction and Kuala Lumpur and Sungei Besi for suburban traffic. Several deviations have been constructed for various reasons. Amongst them have been the Sungei deviation between Sungei Besi and Kajang to avoid excessive curvature and improve the alignment carried out in 1907; and the main line deviation from Kuala Lumpur to Salak South junction to avoid the route through the town between Kuala Lumpur and Sultan Street completed in 1912. The Singapore deviation, of 8½ miles, the most important one constructed by the F.M.S. Railways, was opened to traffic in May, 1932. In Penang, the first hill railway which was built by private enterprise was a failure. The present Penang Hill Railway was constructed by the F.M.S. Railways and opened in 1923. On January 1, 1924, it was handed over to the Colonial Government which now owns and operates it. It is a cable railway of 1½ miles worked by electric power, and the steepest gradient is 1 in 1.95. The upper station is 2,400 ft. above sea level. Railway connection to H.M. Naval Base, Singapore, is given by a railway of about 5 miles which was constructed by the F.M.S. Railways for the Admiralty. The railways administration has also constructed for the War Department in connection with the Singapore defences a railway of about 4 miles in length on the 4 ft. 8½ in. gauge. Kuala Lumpur has had three stations. The first was a temporary structure. In 1892 a permanent station was built on the present site, and this was replaced by the present station begun in 1909 and completed some years later.

Throughout, the brochure is a fine and well illustrated record of the progress of an up-to-date system.



Guillemard bridge spanning the Kelantan River near Sungei Kusial station



Alternating tunnels (Nos. 3 and 4) and bridge on a heavy section of the line



Gua Musang station overshadowed by the great limestone cliff in the background

VIEWS ON THE EAST COAST LINE, FEDERATED MALAY STATES RAILWAYS

This line is 328 miles in length and was completed in 1931. It connects the States of Kelantan and Pahang with the Singapore-Penang main line

A NEW ELECTRIC TAMPER

A handy tool for tamping permanent way by power

IN permanent way maintenance in this country the usual method of maintaining the level of the rails has been to pack the ballast under the sleepers by means of blunt ended picks, or more recently, on most of the railways, by shovel packing, *i.e.*, spreading under the sleepers (which must be lifted off their beds for the purpose) fine ballast. The latter method, in use for many years on the old London & North Western Railway, has now become almost universally popular.

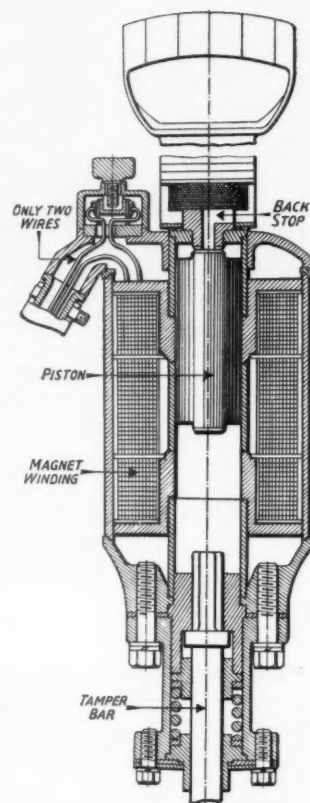
Shovel packing, however, is not alone sufficient in relaying or where the track has to be lifted on new ballast. Then it is necessary to pack the ballast under the sleepers. When this has to be done by hand the process of consolidation is comparatively slow and, depending upon the disturbance of the ballast, may involve a speed restriction for some considerable period. Further, there are places, such as intricate junctions, which are impossible to lift up for the purpose of inserting the chippings used in shovel packing, that always present a problem to the maintenance man. In such conditions, together with the increasing loads and speed of traffic, the advantages of mechanical packing—or tamping—become more apparent owing to the much greater rate at which the work can be carried out, because the power delivered to the ballast is, of course, very much higher in a given time than can be delivered by hand tamping. On lines where there is a dense traffic this is an important matter.

A disadvantage of the mechanical tamper is, of course, that it is necessary to provide it with power, and some sort of portable plant is necessary. But this disadvantage can be far outweighed provided the tools for doing the actual work on the track can be made readily portable and easily manipulated, and provided further that they are simple and not liable to go wrong easily.

We have recently observed sleeper tamping on one of the British main line railways by means of a Heavy

Blow Syntron electric tamper, and were impressed by the fact that it appeared to possess the qualities necessary to make it a practical proposition on British railways; and if satisfactory on British railways it should be no less so on railway systems elsewhere, for the density of traffic in this country is, on the whole, greater than that in almost any other country. The average time taken to pack a sleeper firmly, on a line that had just been given a 3-in. lift, was only about 50 seconds—working with four tools.

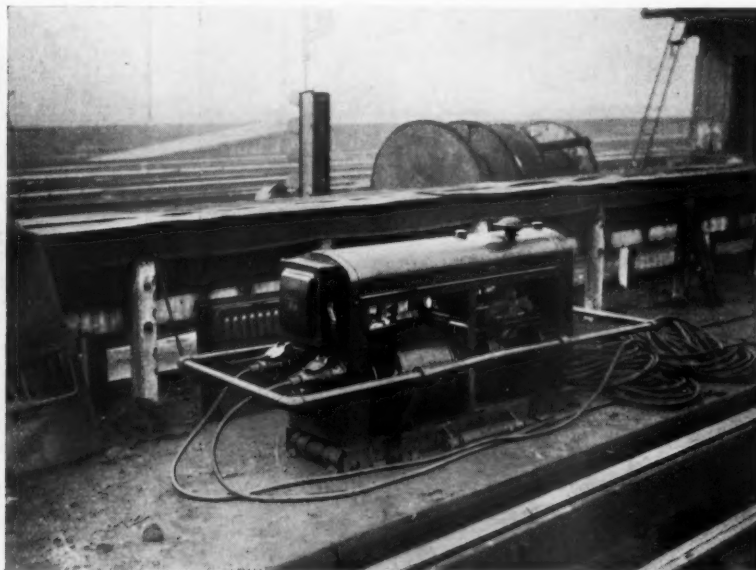
The principle upon which the Syntron works is illustrated in the accompanying diagram, which shows that the tamper consists essentially of a magnet wound round a barrel containing a free moving piston. The magnet pulls the piston up and then down at a high velocity, being energised through the



Section of Syntron tamper



Near view of Syntron tamper



The power plant



Packing sleepers in a difficult position



Packing lifted track

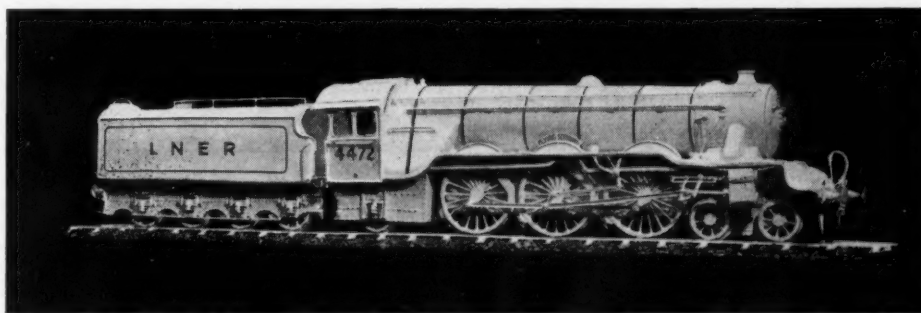
patented Syntro controller, by pulsating currents from the 25-cycle alternating current supplied by the power plant. The piston strikes directly on the tamper bar shank on the down stroke, and against a spring-retained back stop on the up stroke. The piston weighs $4\frac{1}{2}$ lb. and has a $4\frac{1}{4}$ -in. stroke at a speed of 750 blows a minute, giving blows considerably more powerful than those of an 80-lb. compressed air tamper.

The face of the tamper bar being in constant contact with the ballast—the blow being on the shank end of the bar—a powerful forcing effect is obtained that pushes the ballast under the tie before it has had time to pulverise. The construction of the apparatus is simple. The only moving part is the piston, and there are only four tie rod bolts and six cap screws in the assembly. The wound magnet structure is of arc welded construction. There are only two wires, not polarised, so that no mistake can be made in the wiring. Major repairs, including completely dismantling and reassembling the tool, can be done on the track by unskilled labour, there being no delicate adjustments to be made. The tamper depends on the pull of its magnet, not on the fit of the piston, for its power, and therefore a five-year-old tamper will deliver the same blow as a new one.

The whole of the work is done by the tamper, and the operator has merely to hold and guide the tool, not to push it. Various sizes of tool can be used according to the nature of the ballast.

The power unit is a four-cylinder petrol engine direct connected to a 25-cycle 110-V. d.c. generator with a patent controller. It is mounted on rollers so that it can be moved along the track rail. It is surrounded by a handrail and can be easily lifted by six men. The unit is so designed and has such a reserve of power that other tools and electric lights can also be operated from it simultaneously. Any number of tampers up to 16 can be operated simultaneously from one unit, there being several standard size power plants available. Flexible rubber insulated cables carry the current from the power plant to the tampers.

We understand that one of these plants with four tampers has given satisfactory service for some months on the Southern Railway, and has been found particularly useful in the electrified area where there are only very brief intervals between trains, and where there is a multiplicity of points and crossings which cannot be satisfactorily packed by hand in normal daylight working hours.



A model of the L.N.E.R. "Flying Scotsman" locomotive carried out entirely in sugar by the chef of the Royal Exeter Hotel, Bournemouth, from drawings supplied by the railway company, and exhibited at the Hotel, Restaurant and Catering Exhibition at Olympia (see our issues of November 22 and December 6). All cab fittings were reproduced, and even the graduations of the pressure and other gauges were indicated



British Freight Rolling-Stock

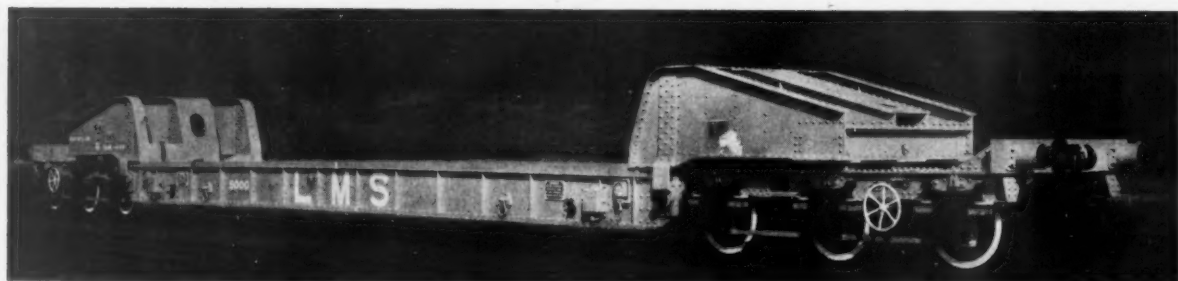
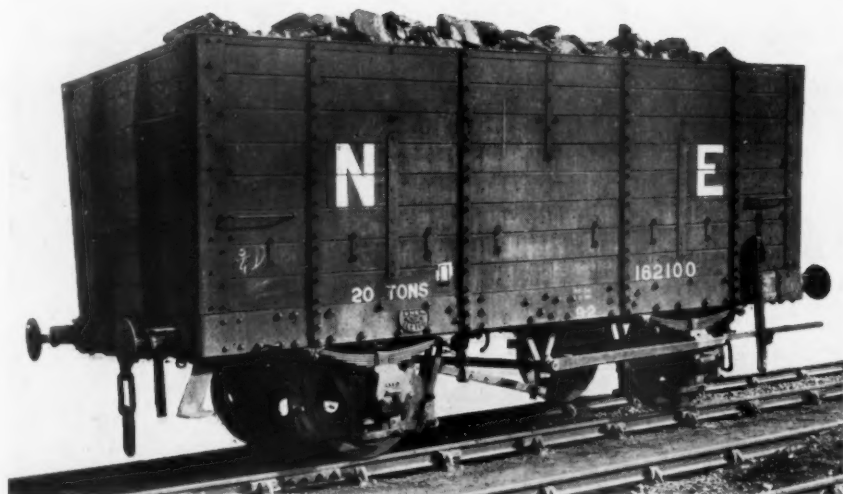
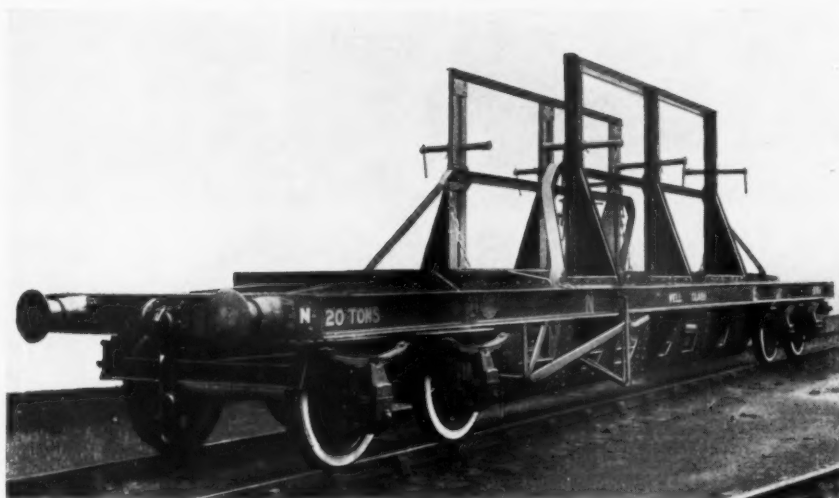
VI.—Representative Wagons for Industrial Traffic

The special freight trolley wagon in the first illustration is lettered in the standard style recently adopted by the L.N.E.R. for all vehicles of this type. It will be noticed that the name of the company in full has superseded the initials "N.E." formerly used.

Carriage of plate glass and window frames demands a low floor level in order to keep these awkwardly dimensioned objects within the limits of the loading gauge. The floor height of the 20-ton L.N.E.R. well glass wagon in the second illustration is only 6½ in. above the rail. Side screws are provided to grip varying widths of carrying cases.

The 20-ton hoppers bottom-door coal wagon in the third illustration is one of 23,000 vehicles of this type owned by the L.N.E.R. Each has eight bottom doors and is of the self-discharging type. The wagons have proved very useful in connection with the heavy coal traffic dealt with on the system.

The last illustration shows a 12-wheel 65-ton bogie well-trolley of the L.M.S.R., constructed for the conveyance of locomotives of any gauge for shipment abroad. These vehicles are fitted with detachable ends or ramps, allowing the engines to run on and off the truck to the rails.



RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Road Vehicle Springs

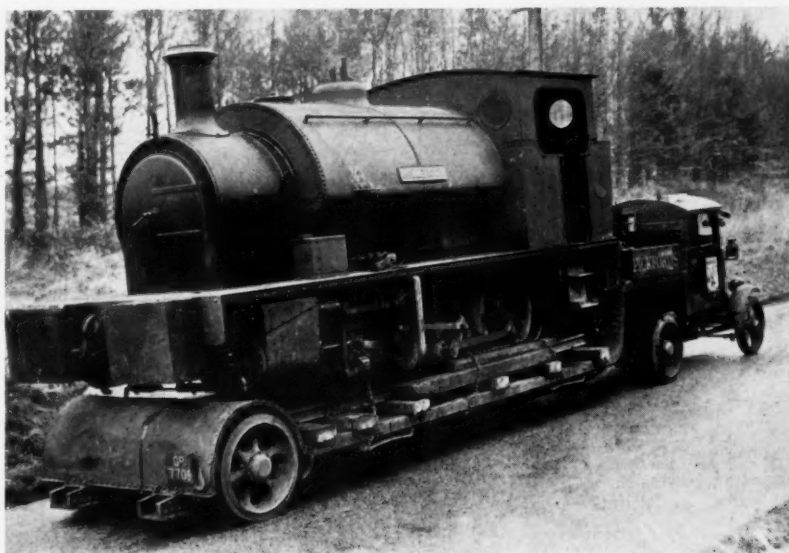
IN a road vehicle the springs between the underframe and the axles have not one duty to perform, as in the conventional railway vehicle, but several. Not only must they support the superstructure at as constant a level as possible while the wheels ride up and down the relatively large irregularities of highway and byway; in addition they must control the lateral motion of the superstructure (*e.g.*, prevent it from running off at a tangent when the vehicle turns a corner) and transmit to the underframe the thrusts and torque reactions due to driving and braking. Under some conditions the springs are actually twisted, while the passage of the vehicle over a particularly large obstacle induces a rebound which may load them from the underside up. In a few words, then, the laminated spring on the modern automobile is subjected to treatment which no one a few years ago would have imagined any spring to be capable of withstanding.

Needless to say, the spring itself while broadly the same as in old horse-drawn carriages, has undergone considerable modification in the details of its construction. Such modification by itself would hardly have sufficed, but metallurgical advances have given the spring manufacturer a more resilient and more reliable steel, and it is in no small measure due to these advances that the modern spring can perform separately, or in combination, the functions of a beam, a strut, a tension member and a torsion member.

Over 60 per cent. of public service vehicles are carried, we learn, on springs manufactured by Samuel Fox & Co. Ltd., whose association with the United Steel Companies Ltd. affords an excellent opportunity for co-operation between manufacturer and supplier of raw materials—an opportunity of which full advantage is taken. In issuing this booklet on road vehicle springs, Samuel Fox & Co. has added to the literature on springs what is practically a text book on automobile suspension. Its subject matter is calculated to be of value to road vehicle designers, but it need not on this account be lacking in interest to those responsible for railway vehicles. The remarks on pages 11 to 18 concerning riding comfort, and especially those relating to seat design, are the most notable contributions on the subject we have yet encountered. A discussion on pitching (pages 11 to 13) leads to some useful suggestions, and so does a discussion on roll (pages 21-26). The anchor clips used on Fox springs introduce additional frictional resistance in those springs

which are partially relieved of load when rolling begins. In the last few pages illustrations are given of rail vehicles having the automobile type of suspension in place of the more usual suspension incorporating hornblocks. Tramcars of the bogie and two-axle type are shown thus equipped, and it may be presumed that they run satisfactorily, though considering the way in which tramcars, particularly two-axle tramcars, negotiate curves, we should judge the sideways impacts on the springs to be very severe. No pneumatic tyre is provided to soften the shock and the centre of gravity is low even according to automobile standards. Illustrations are given of the springing of the Leyland two-axle railcar, which is unlike any other, and of the A.E.C. railcar springing, which follows standard railway practice.

Stages in the manufacture of Fox springs are depicted and some of the photographs are of sufficient artistic and technical merit to have been shown at the 1935 summer exhibition of Professional Photographers' Association. Tables giving the physical properties of the steels favoured for spring manufacture show very clearly the superiority of chrome-vanadium steel. This steel has a resilience figure twice that of the next best steel and it is not so easily spoiled by abnormal treatment during the making of the leaves. A feature of "Road Vehicle Springs" which helps to make it attractive is the careful placing of the illustrations so as not to interrupt the continuity of the text.



Rail and Road. A contractors' locomotive having done duty in the construction of the extensions to Southampton docks being carted by Pickfords Limited to Chingford (Essex) to assist the making of a new reservoir

Trolleybus Services in London

Some details of the working arrangements and the equipment installed by London Transport for the new services in suburban districts

IN view of the way in which trolleybuses are being utilised not only in London and many cities and towns in Great Britain, but also in many places abroad where electric current is available at cheap rates, it may be opportune to place on record some details of the vehicles and equipment as used in the London area.

The services between Wimbledon, Hampton, and Twickenham have been running for some years. The opening of those operating from Shepherd's Bush and Hammersmith to Hounslow and Hampton was reported in THE RAILWAY GAZETTE of November 1, while the changeover on the Woolwich, Erith and Dartford services was recorded in the issue of November 15. For the West London services the old Hounslow tramway depot has been reconstructed and enlarged, and the services from Sutton are likewise running from the tramway depot at Sutton, which is in process of being remodelled on the lines of the conversion at Hounslow. For the Woolwich

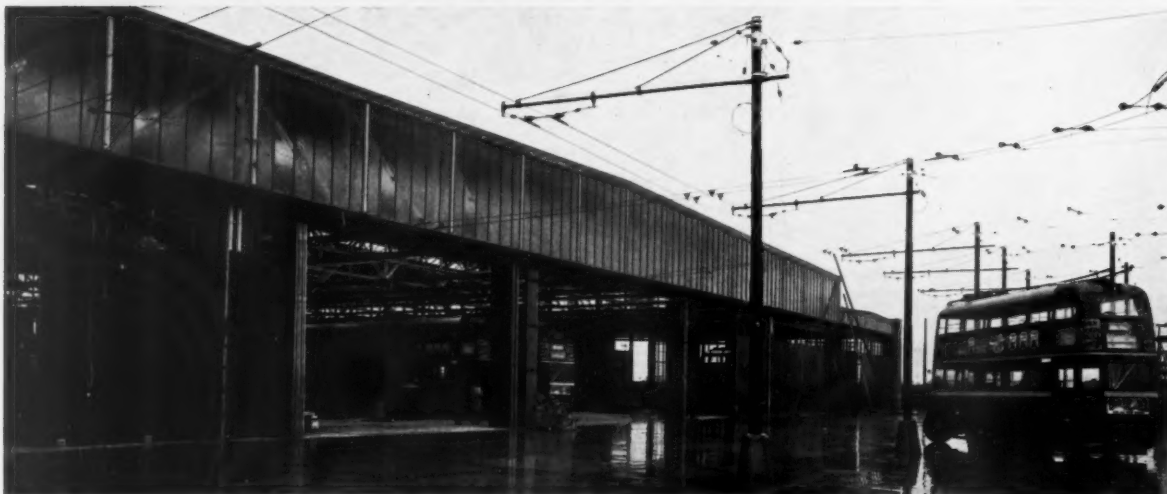
and Dartford services a new depot has been built on the Erith Road and known as the Bexley Heath depot. The first of its kind in the metropolis, it is a spacious building, as our illustrations show, designed specially for trolleybus operation by the board's architect. With a frontage of 314 ft., set nearly 70 ft. back from the road, it provides a floor space of 36,670 sq. ft. and has a capacity for 60 trolleybuses. Offices, messrooms, canteen, billiard room, &c., are on two floors ranged along the south wall.

With the exception of short distances, the routes in London are in substitution of tramways, and as a large proportion of the tramway poles were in good condition it was decided to utilise them wherever possible for the trolleybuses. To enable them to hold up double the weight of wire, a bigger sag on the cross-road suspension



The turntable and traverser installed by S. H. Heywood & Co. Ltd., in use at the Hounslow depot, which enables the vehicle to be manœuvred into any position within the minimum space

LONDON TRANSPORT TROLLEYBUSES



The top picture shows how easily the vehicles may be manœuvred in the pillarless area of the Bexley Heath depot. In the middle picture is seen the area behind the Bexley depot, with its overhead wires to enable the buses to be driven over any portion of it. The bottom photograph illustrates the pits, with lights in the side walls and the steps between each pit

wire was allowed, thus reducing the strain on the poles, and making it possible for the second trolley wire to be added without overloading the poles.

In order to keep the positive and negative wires, which are 24 inches apart, at the same level, a special fitting was evolved consisting of a steel bar carrying two insulators and having a set at each end to enable this fitting to let in the curve of the wire and yet remain horizontal between the two insulators carrying the wires. Porcelain insulators are used, of the type which has stood up so well to rough work in the conduits, and the fitting is so designed that an insulator can be changed if required in a few minutes. This fitting does away with the necessity of the auxiliary span wires and gives a cleaner appearance. Frogs and crossings are of orthodox design, connected by solid running strips. The wires are joined to the fittings by file cut steel grips which give a perfectly smooth running surface.

Supply Arrangements

The additional power requirements of the large trolleybuses and the frequent services have been met by installing an automatic glass bulb rectifier substation every two miles. On the average, 4 pairs of 0.4-sq. in. feeders run



A group of former tram drivers having the working of the trolleybus contactors and control gear explained to them preparatory to being placed in charge of the new vehicles

from each substation to give separate feed to each half-mile of overhead. The feeders are protected by high speed circuit breakers on the positive side coupled with contactors on the negative side.

They are of the automatic type capable of reclosing six times in succession and then remaining open. At the other end of the feeders two push buttons are installed in the feeder pillar; by depressing the "stop" button, which can be held down by a catch, the circuit breaker is kept locked out and cannot be replaced even by hand in the substation. This enables either the traffic or electrical staff to ensure that the track remains dead in case there is trouble on the overhead equipment. When the trouble is cleared, by releasing the catch and depressing the button labelled "start," the circuit breaker is reset and can function normally. When a breaker has locked out it is not necessary to go to the substation to reset it, for the push button on the feeder pillar labelled "start" will again reset it. The d.c. supply at the substations is given at 600 V.

Substations

The substations are fed from a pair of 11,000-V. 0.15 cables. The substations on straight roads are standardised

at 500 kW., where three roads meet at 750 kW., and where two roads cross at 1,000 kW. The equipment consists of four bulbs arranged in two pairs, each pair on its own transformer and feeder, so that the installation consists of two independent units. The a.c. switchgear in each substation consists of two groups of three units joined by a bus coupler. Each unit consists of an oil switch to the transformer and two non-automatic isolator switches controlling the incoming and outgoing feeders.

Normally the substations run with the bus coupler open and each section of rectifier on its own feeder. A fault on cable, transformer or rectifier will shut down only one half the equipment, but the overload capacity and the margin in plant will enable the substation to carry its load until the inspector disconnects the faulty feeder and closes both sections through the coupler on to the sound feeder. Visual indicators will be provided on the route to notify the first passing bus that a section of the substation is "off" by means of the telephones installed at each half-mile feeder pillar, and the information is passed to the controller, who calls out the maintenance men. This arrangement should prevent any delay to traffic.

All-Insulated System

It is proposed on all routes where the substation feeds only trolleybuses to run with both negative and positive wires insulated from earth instead of having only the negative earthed. The experiment has been tried with one substation on 3 miles of route for some months, and no disadvantages have shown themselves. A special indicator has been evolved whereby the insulation resistance of the whole section, including feeders and cars, can be determined while the section is alive, and each substation is equipped with one of these instruments.

Trolleywheels have been discarded for skates, and a system of pressure lubrication has been evolved which has given satisfaction on trial over several months.

For operating the services from the Hounslow depot a fleet of 52 trolleybuses, each seating 70 passengers—38 in the upper saloon and 32 in the lower—has been acquired. They have bodies built by the Metropolitan-Cammell-Weymann Motor Bodies Ltd., on chassis by the Associated Equipment Co. Ltd., with electrical equipment supplied by the English Electric Co. Ltd., the contract being secured by A.E.C. in open competition as their agreement with London Transport with regard to the supply of motor buses does not cover trolleybuses. For the Bexley Heath services a fleet of 38 vehicles, each seating 60 passengers—32 in the upper saloon and 28 in the lower—has been secured. They have bodies built by Brush Electrical Engineering Co. Ltd., on chassis built by Leyland Motors Limited, with electrical equipment supplied by Metropolitan-Vickers Electrical Co. Ltd.

With regard to the depots, some details were given in our issue of November 1 of the reconstruction work that has been carried out at Hounslow. At Fulwell only the necessary alteration to the overhead equipment has been made; the required docking pits, washing and cleaning plants were already installed to deal with the 63 trolleybuses that operate in the Twickenham, Kingston and Wimbledon districts. Fulwell is at the same time the main overhaul depot for the trolleybus fleet in the area. We have already referred to the Bexley Heath depot and it only remains to add that the equipment there includes a vacuum cleaning plant by the Sturtevant Engineering Co. Ltd., a B.E.N. Cyclone washing plant supplied by Thos. P. Headland Limited, a Lacey-Hulbert air bottle charging plant, heating apparatus by Benham and Sons Ltd. and Gibbs and Lucas folding and sliding doors.

A New Thornycroft Vehicle

It may be recalled that included in the Thornycroft display at the recent Commercial Motor Transport Exhibition was an example of the latest Thornycroft Trusty chassis, in the design of which several new constructional features have been introduced, while it was also clear that every endeavour had been made to lighten weight as much as possible without limiting strength as a whole or the margin allowed for occasional overload.

In the first place, the disposition of the axles is such that with an evenly distributed load over a platform body of maximum legal length, the proportion of the total weight of the front and rear axles is approximately 4 tons and 8 tons respectively.

The chassis has been designed for carrying payloads of $6\frac{1}{2}$ to 8 tons, with a maximum gross weight laden of 12 tons, on two axles. From the master data sheet that has recently been issued by John I. Thornycroft & Co. Ltd., it is seen that the chassis is being offered with either 4 or 6 cylinder petrol engines or 4 or 6 cylinder compres-

sion frame of 18 ft. 4 in. and 22 ft. 4 in. respectively. Where a trailer is hauled, however, the body space on the vehicle proper must be reduced slightly so that the overall length of the towing vehicle does not exceed the maximum legal limit of 26 ft.

Our illustration is of one of the first of the petrol-engined vehicles to be placed in service and full detailed specifications of either chassis together with the data sheet, already referred to, can be obtained from the makers.

Road Services in New Zealand

In the annual report of the New Zealand Government Railways Board it is stated that the profit on the road motor services for 1933-34 was £2,368, as compared with £521 in the previous year. It is pointed out that this profit is that after interest has been debited on the capital invested in the services and allowance made for depreciation on vehicles and plant. The total passenger journeys were 2,783,184, an increase of 42,921 over the previous year. The total revenue was £79,184 and the expenditure £76,816. The Hutt Valley services formed the largest item in the accounts, with 2,083,935 passenger journeys, revenue £55,519, and expenditure £54,000. The next largest was the Napier-Hastings section with revenue of £16,736, a slight falling-off occasioned by the completion of re-building operations following the earthquake, with expenditure of £16,185, also reduced through the number of buses used being reduced from 12 to 11. The youngest service, put on between Waipahi and Edievale to take the place of the passenger train services, after four months showed a revenue of £306 and an expenditure of £349, but that included a charge of £30 for freight on the bus from Wellington, so the results for the initial period are deemed satisfactory.

The Dunedin-Port Chalmers service continues to show increased business and a loss of £700 was converted into a profit of £299. Passenger journeys increased from 139,978 to 175,799, or 25.59 per cent. Bus-mileage increased by 12,425 miles (or 16.69 per cent.). Expenditure amounted to £4,541, a decrease of £37 on the previous year's figures. Running-costs increased by reason of the increased mileage, but the cost per mile decreased from 8.10d. to 7.25d.

Road Motor Services in South Africa

It has been announced by the General Manager of the South African Railways and Harbours that a new Leyland 6-cylinder passenger vehicle was placed in service on September 25 and allocated to the West Rand service, recently taken over by the Administration, which operates between Johannesburg and Durban Deep. The vehicle is equipped with an all-metal body, fitted with tubular seats, upholstered in hide over rubber sponge fillings; it is capable of seating 35 passengers. It is stated that in view of the growing popularity of the West Rand service, this modern vehicle will fill a much-felt want in so far as the comfort of the regular travelling public is concerned.

During October the route mileage of the road services was increased by 132 miles to 11,104, in spite of the fact that two services had to be withdrawn owing to lack of support. There were several new routes opened up, including one between Keetmanshoop and Koes, a distance of 98 miles. The figures for August, the last available, show that the vehicle miles totalled 473,146, and that the revenue worked out to 19.6d. per vehicle mile, while the expenditure on the same basis was 16.2d. The number of passengers carried during the month was 207,409, the traffic in cream was 71,065 gallons and in goods totalled 36,939 tons.



One of the latest petrol-engined Thornycroft Trusty vehicles engaged on freight carrying in London

sion-ignition oil engines, while there are alternative lengths of wheelbase so that the varying body requirements of different trades may be met satisfactorily.

In regard to the power units, the four- or six-cylinder petrol engines are of $4\frac{3}{8}$ in. bore and $5\frac{1}{4}$ in. stroke, and developing up to 80 b.h.p. and 110 b.h.p. respectively, while oil units are four- or six-cylinder compression ignition engine of Thornycroft manufacture, having cylinder dimensions of $4\frac{1}{8}$ in. bore by 6 in. stroke, and developing up to 85 b.h.p. and 100 b.h.p. respectively. The four-cylinder engine models are recommended for solo work, while the six-cylinder engine models are fully capable of towing a trailer, when a maximum legal payload of up to 15 tons can be carried per journey.

The standard wheel base is 12 ft. 8 in. with an alternative wheel base of 15 ft. 3 in., providing a legal body space from the back of the driver's cab to the end of the

RAILWAY NEWS SECTION

PERSONAL

Mr. Frederick Bramley, General Agent for the company in Northern Ireland, has been appointed by the President, Sir Edward Beatty, to be Secretary of the Canadian Pacific Railway, with headquarters in Montreal.

L.M.S.R. APPOINTMENTS

Scottish Changes

Mr. H. Ross, District Goods and Passenger Manager, Ayr, to be District Goods and Passenger Manager, Aberdeen.

Mr. R. Marshall, District Goods and Passenger Manager, Edinburgh, to be District Goods and Passenger Manager, Ayr.

Mr. A. C. F. Calladine, Stationmaster, St. Pancras, to be District Goods and Passenger Manager, Edinburgh.

INSTITUTE OF TRANSPORT

The following corporate members and associate members were elected during November:—

Members

Mr. R. S. Douglas, District Goods and Passenger Manager, Dundee, L.N.E.R.

Mr. W. Lyle, District Operating Superintendent, Burntisland, L.N.E.R.

Mr. C. E. R. Sherrington, Secretary, Railway Research Service.

Associate Members

Messrs. A. F. Andrews, L.P.T.B.; D. Fazakerley, L.M.S.R.; G. M. Johnston and A. Palfreyman, L.N.E.R.; A. Phillips, P.L.A. (Railway); W. R. Ritchie, New South Wales Government Railways; J. E. F. Salter, South African Railways and Harbours; and J. A. R. Turner, Southern Railway.

M. Paul Baillarguès retired from the post of Operating Superintendent to the Paris-Orleans and Midi system on October 1. Born in 1869, M. Baillarguès entered the service of the Paris-Orleans Railway in 1890, and became Assistant Stationmaster at Vierzon the following year. In 1894 he was appointed Traffic Examiner at Blois and then at Angoulême, becoming Inspector at Lorient in 1898, and Nantes in 1899. He was appointed Stationmaster at Tours in 1901, and Chief Inspector at Périgueux in 1904. Four years later he was transferred to the Central Traffic offices as General Traffic Inspector, and was promoted to be Assistant Superintendent in 1914, Deputy Superintendent in 1921 and finally Superintendent in 1934. M. Baillarguès received the Croix de Guerre in 1919 and the Cross of the Legion of Honour in 1920.

Mr. George Francis Thurston, who, as announced in our issue of December 6, is retiring at the end of the year from the position of Divisional General Manager, Southern Area, L.N.E.R., joined the Goods Department of the former Great Eastern Railway at Bishopsgate in 1885. He was transferred to the District Goods Manager's Office in 1889, and to the



Mr. G. F. Thurston,

Divisional General Manager, Southern Area, L.N.E.R., 1929-35

Funds office in 1890. On the inauguration of the Railway Conciliation Scheme in 1907 he became Secretary of the company's side of the respective boards. He was appointed Secretary of the Superannuation, Pensions and Accident Funds in 1910, and Staff Assistant to the General Manager in 1917. Mr. Thurston became Secretary of the company in 1919, retaining the offices of Secretary of Funds and Conciliation Boards until 1923, and at the time of the amalgamation was appointed Joint Secretary, with Mr. J. McLaren, of the L.N.E.R. group. In January, 1925, he was transferred as Chief Stores Superintendent and in July, 1929, became Divisional General Manager, Southern Area, the position from which he now retires under the

age limit. Mr. Thurston continued as a committeeman and trustee of the G.E.R. Funds, and thus kept in close touch with the members of his former company.

NORTHERN IRELAND ROAD TRANSPORT BOARD APPOINTMENTS

The board has made the following appointments:—

Mr. James Courtney to be Chief Engineer.

Mr. James Crothers to be Traffic Superintendent.

Mr. Percy Garrett to be Body-building Superintendent.

Mr. Arthur Culbert to be Assistant Traffic Superintendent, passenger section.

Mr. Courtney has had long road transport experience and until its transfer to the board was Chief Engineer of the Belfast Omnibus Co. Ltd. Mr. Crothers also had experience with that concern, and Mr. Culbert was for many years Traffic Manager of H. M. S. Catherwood Limited prior to its being taken over by the board.

INDIAN RAILWAY STAFF CHANGES

Mr. C. E. Long has been confirmed as Superintendent of Stores, Burma Railways, as from October 24, from which date Mr. C. M. Greenway was permitted to retire from Government service.

Mr. H. J. Allinson has been appointed Deputy Chief Mechanical Engineer, Electrical, E.B.R., as from October 15.

Mr. J. M. D. Wrench, C.I.E., has been confirmed as Chief Controller of Standardisation (Railway Board), as from April 1 last.

Mr. P. G. Shah, on return from leave, resumed duty as Deputy Chief Accounts Officer, G.I.P.R., on October 8.

Mr. I. S. Puri has been appointed Deputy Director, Railway Clearing House Accounts, as from October 30.

Mr. H. H. Yule, Officiating Chief Commercial Manager, E.I.R., has been granted 19½ months' leave preparatory to retirement, as from November 30.

We regret to record the death, on November 14, at the age of 63, of Mr. Robert John Buchanan, formerly Telegraph Superintendent of the Central Argentine Railway. He was born in Argentina, joined the Telegraph Department of that railway as a junior clerk in 1889, and was promoted to Assistant Telegraph Superintendent in July, 1905. In June, 1911, he was appointed Telegraph Superintendent,

occupying this position until his retirement on pension in November, 1923.

Mr. Donald Alexander Matheson, M.V.O., J.P., T.D., M.Inst.C.E., M.Inst.T., whose death we recorded briefly in our issue of December 13, was born in Perthshire in 1860 and educated at Perth Academy. In 1877 he entered the office of the late Mr. John Young, M.Inst.C.E., Perth, whose pupil he was until 1881. He afterwards studied at the Watt College, Edinburgh, and Owens College, Manchester, was engaged in sundry engineering work, and in turn acted as an Engineering Assistant on the construction of the Edinburgh Suburban Railway, and on the London & North Western Railway at Manchester, and also as contractor's Resident Engineer and Agent on construction of the Lanarkshire and Ayrshire Railway. He was subsequently engaged for about five years as Resident Engineer for the Caledonian Railway, on construction of the Glasgow Central underground railway, on completion of which, in 1896, he was appointed Divisional Engineer for the Western Division of the Caledonian Railway, and in 1899 was appointed Engineer-in-Chief. On the retirement of Mr. Guy Calthrop from the position of General Manager at the end of September, 1910, Mr. Matheson was selected to succeed him. In 1912 he became a member of the Communications Board attached to the War Office and the Board of Trade, which at the beginning of the war automatically became the Railway Execu-



The late Mr. Donald Alexander Matheson, M.V.O.,

Engineer-in-Chief (1899-1910), and General Manager (1910-23) Caledonian Railway; and Deputy General Manager for Scotland, L.M.S.R., 1923-26

utive Committee. Representing the Scottish railways, Mr. Matheson was a member of that committee and its various sub-committees during the entire period of the Government control of the railways. In 1917 he was Chairman of the General Managers'

Conference of the Railway Clearing House, and upon the amalgamation of railways to form the L.M.S.R., he became Deputy General Manager, or General Manager for Scotland, of that group. Mr. Matheson retired at the end of 1926 and in the following year was awarded the M.V.O. He was a member of the National Wages Board, and, besides frequently sitting on the Tribunal as such, he also appeared before it as an advocate on behalf of the combined Scottish railway companies. Mr. Matheson was a member of the Institution of Civil Engineers, a member of the Institute of Transport, a member of the British Engineering Standards Association, Past President of the Glasgow Association of Students of the Institution of Civil Engineers, and Past Vice-President of the Institution of Engineers and Shipbuilders in Scotland. He was a Lt.-Col. in the Engineer and Railway Staff Corps and was awarded the Territorial Decoration. He was also a J.P. for Glasgow.

Mr. A. L. Regamey, General Tourist Agent of the Canadian National Railways in France, has been appointed General Agent of the railway.

We regret to record the death, on December 15, of Sir Hector Munro of Foulis, a member of the Scottish Committee, L.M.S.R.

Mr. Herbert Marriott, C.B.E., sometime Chief Goods Manager, L. & Y.R. and Assistant to the General Manager, L.M.S.R., left estate valued at £39,198 (£37,165 net).



Front Row, left to right: M. Bauman (B.A.G.S.R.); J. A. Zedoff (ex-Stores Supt. B.A.G.S.R.); Ernest Cooper (Local Director, Anglo-Argentine Tramways); M. Silva (Engineer, Hydro-Electric Station); W. Lawson Hutton (Resident Engineer, Chilean Electric Company); J. G. Mayne (Chairman), G. R. Mawson (Vice-Chairman) and F. C. Egerton, (Hon. Sec.) of the Centre; G. E. Keil (Secretary, Traffic Dept. Central Argentine Railway); Armando Benegas (Asst. Chief Accountant, Chilean State Railways), and W. Bell, (B. A. and Pacific Railway)

Visit of the Institute of Transport (Argentine and River Plate Centre) to Chile

Liverpool Street Station

On December 6, Mr. H. C. R. Calver, stationmaster, Liverpool Street station, L.N.E.R., delivered a paper before the L.N.E.R. (London) Lecture and Debating Society entitled "Liverpool Street—What we do, and how we do it."

Dealing first with staff organisation, Mr. Calver said that there were two assistant stationmasters, whose duties were best summed up as effecting mobile supervision, and seven inspectors, under whom there were 14 station foremen in charge of their respective gangs. The total personnel of the station was 395, which included 41 guards, 63 ticket collectors, and 90 grade 2 porters. Of this staff, 75 were passed for fogging duties, after examination each year. The clerical staff, consisting of only one commercial and four operating clerks, was the smallest of any comparable London terminal. This was made possible by certain sections of the headquarters administration being accommodated in the station, and thus having direct contact with the public. The Passenger Manager's general inquiry office, for instance, dealt with all train and general inquiries. Such an arrangement called for co-operation between the stationmaster's and the headquarters staffs.

Mr. Calver then described the work of his station, in which, during the course of a normal day, 1,260 trains, nearly 230,000 passengers, and 10,000 bags of mails and parcel post were dealt with. So far as signalling was concerned, the station's territory began at East London Junction, and there were altogether seven signal boxes, staffed by 34 signalmen. The ordinary train service was charted, and a platform list drawn up. A peculiar feature of Liverpool Street traffic, emphasised by Mr. Calver, was the large use made of incoming trains for making up outgoing trains, due to the distance of the terminus from the carriage sidings. While this working was economical so far as empty carriage train mileage was concerned, it called for unceasing vigilance on the part of the staff, as late arrivals of necessity meant also late departures.

Excursion and special trains sometimes provided problems. One of the most difficult types of special traffic had been Thomas Cook & Son's "Grand Tour of Germany" special trains, run bi-weekly on Saturdays during the summers of 1934 and 1935. Cooks required the despatch of a special train from Liverpool Street at 9.30 a.m. so that tourists might catch the same boat as passengers leaving Liverpool Street at 10.0 a.m. The only available path from Liverpool Street was at 9.30 a.m., and the only available path for the set of cars, consisting of 14 Pullman coaches, into Liverpool Street was at 9.6 a.m. Thus the station staff was faced with the problem of loading in 24 min. 400 tourists leaving England for a fortnight's holiday in Germany.

Each passenger had an allocated seat, and it was estimated that in the despatch of one train no fewer than 250 taxicabs entered Liverpool Street station. The problem was surmounted by a careful redistribution and increase of staff, and the full use of electric barrows. On the return journey a system of baggage labelling was introduced so that each passenger's luggage was labelled with an index letter corresponding with the index letter of his or her coach, and on arrival the luggage was immediately stacked into heaps, bearing the appropriate index letter. On one occasion this huge traffic was thus cleared in six minutes. At holiday times a carefully pre-arranged allocation of the various up trains to different portions of the station ensured that there was no undue congestion at any one point.

It was not generally known, Mr. Calver added, that Liverpool Street had a "ghost train." This was the 12.7 a.m. goods from Stratford which brought the coal, permanent way material, and any truck traffic for the various departments. This was Liverpool Street's only scheduled goods train, and it provided the night shunters with a busy hour and a half placing coal wagons at the various stages and docks, withdrawing trucks filled with ashes, and getting any empties ready for despatch. Last year these coaling docks dealt with 14,610 tons of coal, while 96,000,000 gall. of water were drawn from the mains to supply the various water cranes. Certain "Q" timings were agreed to, and when necessary, goods trains were run in to Liverpool Street for the purpose of passing forward to Spitalfields traffic from Hither Green or New Cross.

All the lost property found on the old G.E. Section was dealt with at Liverpool Street. The usual procedure, Mr. Calver remarked, was for stations to retain lost property for 48 hours, and if no claimant was forthcoming, to forward it to Liverpool Street, where it was registered. Perishable articles were disposed of almost at once, and the amount realised at the sale paid into the credit of the compensation salvage account. Non-perishable property was retained for six months and then, if still unclaimed, was sold. Efforts were made to trace the owners of any article bearing an address. Last year the office dealt with 8,638 gloves; 8,846 parcels; 6,024 umbrellas; 560 luggage; 224 booked parcels; 681 purses; and 680 articles of jewellery.

Mr. Calver then described the work of three cloak rooms at Liverpool Street. The annual revenue from this source was about £3,800, and about 308,500 packages were handled each year. Another valuable source of income at Liverpool Street was the baths, dressing-rooms and lavatories, which together produced a revenue of well over £6,000 a year. In 1934, the sale of 241,728 platform tickets brought

in over £1,000. The stationmaster at Liverpool Street was also responsible for the provision of lavatory towels on certain trains. Last year 424,344 towels were distributed, and 1,570 gross of soap tablets used. For cleaning purposes the station used in the course of a single year 160 gall. of fluid disinfectant, 2 tons of powder disinfectant, 250 mops, and 55 platform sweeping brooms. A contract had also been given for 1,080 bags of sawdust a year.

After touching briefly on newspaper traffic, Mr. Calver then dealt with the handling of the mails at Liverpool Street. This had undergone a complete change since the G.P.O. tube railway was opened, linking Paddington with the Eastern District Office in White-chapel Road. It had resulted in a reduction and even flow of vehicular traffic into the station. During normal working, 690 G.P.O. underground electric trains, consisting of 920 cars, were dealt with at Liverpool Street station daily. During the Christmas rush the daily trains were increased to 880, consisting of 1,760 cars.

"The Principles of Commerce"

At Paddington station, on December 12, Sir Robert Horne, Chairman of the Great Western Railway Company, presided over a meeting of the G.W.R. Lecture and Debating Society at which Sir Francis Goodenough, Chairman of the British Commercial Gas Association, gave an address on "The Principles of Commerce." The speaker said that principle should just as definitely govern the action of a business concern as the life of an individual or the affairs of a nation. Principle was immutable—policy was variable. The latter must, to be living, have the elements of initiative, enterprise, experiment and adventure. Salesmanship was an absolute essential in the successful marketing of any service or commodity offered to the public, but sharp practices were never justifiable. The widely accepted saying "business is business" sometimes proved an excuse for a deplorable disregard of honesty and humanity.

There should be no distinction between honour in commercial and private life. Salesmanship, founded on a spirit of service, should begin in the board room and pervade the whole of an organisation, for the selling policy of a firm determined its success or failure. The seller should direct his energies to winning the enduring confidence of the customer by considering his point of view and meeting his requirements in every reasonable way possible. This business truth had become far more realised by commercial undertakings in recent years than it used to be. Personal interviews, in the view of the speaker, should where possible take the place of letters in important business matters, and especially in dealing with customers' complaints.

QUESTIONS IN PARLIAMENT

Level Crossings

Lieutenant-Commander Tufnell on December 5 asked the Minister of Transport whether, in view of railway extensions in this country, he would state the attitude of his department with regard to the creation of level crossings in such extensions.

Mr. Hore-Belisha.—Standing Orders provide that no railway shall be authorised to be made across any public carriage road on the level, unless the Committee on the Bill, after considering a report from some officer of the Ministry of Transport, shall recommend such crossing, stating the reasons and facts upon which their opinion is founded and my Department discourages, so far as is practicable, the creation of crossings over railways.

The Channel Tunnel Proposal

Captain A. Evans asked the Prime Minister if he would state the present position of the Channel Tunnel scheme, and what was the attitude of the Government towards the proposal.

Mr. Baldwin.—There is no change in the attitude of His Majesty's Government on this question.

Captain Evans.—May I ask the Prime Minister whether he will define to the House what that attitude is?

Mr. Baldwin.—It will be within the memory of the House. So far we have not seen our way to support the proposal.

Employees on Indian Railways

Mr. Day, on December 9 asked the Under Secretary of State for India whether he had any statistics and could state the number of Anglo-Indians that had been replaced by Indians in the employ of the Indian State Railway during the last five years.

Mr. Butler.—There have been reductions of staff during the last five years among all the communities. It is not possible from the figures which I am circulating to make any inference with regard to the second part of the hon. member's question. The following table shows the number of Europeans, Indians, and Anglo-Indians on rates of pay of Rs. 250 and upwards serving in the State railway services in each of the years 1930-34:—

	Euro- peans	Anglo- Indians	Indians	Total
1930	2,216	2,747	2,671	7,634
1931	2,206	2,573	2,621	7,400
1932	2,042	2,498	2,532	7,072
1933	1,929	2,439	2,499	6,967
1934	1,782	2,393	2,530	6,705

Railway Electrification

Mr. Chorlton on December 11 asked the Minister of Transport if he could state the progress made by railway companies concerned in their investigation of the question of electrifying the railways of South Lancashire and the West Riding of Yorkshire.

Mr. Hore-Belisha.—The railway companies concerned have informed me

that they are examining the case for electrifying certain lines in the areas referred to, but that their inquiries have not yet reached a stage where a definite decision can be taken.

Mr. Short asked the Minister of Transport whether, in connection with the schemes guaranteed by the State for the electrification of the railways, he would ensure that railway workers discharged in consequence thereof would receive compensation.

Mr. Hore-Belisha.—I understand that in the past railway companies have not had to discharge men as a result of electrification and I see no reason to suppose that the schemes of electrification now proposed with a view to improving and increasing services should have such a result.

Sir Brograve Beauchamp asked the Minister of Transport whether he had now any further information to give in respect to the electrification of the Liverpool Street to Chingford suburban line service.

Mr. Hore-Belisha.—I have been informed by the L.N.E.R. that as the programme of improvements in passenger transport facilities in the London area, announced last June, is already very extensive and involves as great a burden of expenditure as can be undertaken at present, it would be impracticable to enlarge the schemes so as to include the electrification of the line between Liverpool Street and Chingford. The company has assured me, however, that the situation will receive further consideration when the developments at present in hand have made further progress and have become self-supporting.

Railway Employment Figures

Mr. Ede asked the Minister of Transport whether he was aware that the employment figures in the railway industry taken in March and April last were not published till September; and would he state the reason for the delay of five months.

Mr. Hore-Belisha.—The census of railway staff taken during a week in March involves the collection, checking and compilation of much detailed information from every part of the country. As soon as the return is ready it is published.

A Coal Company's Way-leave

Mr. Walker asked the Secretary for Mines if he was aware that the decision of the Court of Appeal in the case of the Consett Iron Company *v.* Clavering and Towneley Trustees, under the Mining Industries Act, 1926, had given an interpretation of the Act contrary to that given by a Scottish Court in a similar case; that no appeal could be made to the House of Lords for a final ruling on the matter; and that by the said decision of the Court of Appeal the Consett Iron Company was

compelled to pay an annual way-leave of £6,000 as against the £270 fixed by the Railway and Canal Commissioners, which placed a heavy burden upon the collieries owned by the company; and whether he was prepared to introduce legislation forthwith amending the 1926 Act so as to remove this state of affairs and to relieve the colliery industry of excessive land charges.

Captain Crookshank.—The answers to the first three parts of the question are in the affirmative. With regard to the last part, the question is being carefully considered in conjunction with other important problems affecting the coal industry.

A Suggested East African Railway.

Mr. Gallacher, on December 18, asked the Secretary of State for Foreign Affairs whether the arrangements respecting the concessions asked for by the British and Italian Governments regarding Lake Gsana and the railway connecting Eritrea and Italian Somaliland, as outlined in the notes exchanged between His Britannic Majesty's ambassador in Rome and Signor Mussolini, on December 14-20, 1925, were still in force; and, if not, whether the League of Nations had been notified by either of the interested parties that the proposals presented 10 years ago had now lapsed.

Mr. Baldwin (Prime Minister) replied.—The answer to the first part of the question is in the affirmative. The second part does not therefore arise.

Parliamentary Notes

Railways (Agreement) Bill

In the House of Commons on December 12 the money resolution authorising the State guarantee of principal and interest on loans to be advanced to the main-line railway companies (up to an amount of £26,500,000) was agreed to on report without discussion. The Railways (Agreement) Bill which is the necessary Bill founded on the previous financial resolution was then brought in and read a first time. The second reading of the Bill was agreed to on December 13 without a division, but after a discussion which lasted for nearly five hours. Mr. Chamberlain explained the measure in some detail, and there was a good deal of criticism from the opposition. On December 17 the Bill passed through Committee without amendment, although a few amendments proposed by Labour members were withdrawn or negatived. The Chancellor of the Exchequer also made further statements on some financial points. The third reading was carried in the House of Commons on December 17, and the Bill was read a first time in the House of Lords on the same day. It was read a second time in the House of Lords on December 18. The third reading in that House was to be taken yesterday (Thursday), and the Royal Assent is expected to be given today (Friday). We hope to publish a report of the debates on the Bill at its various stages in our issue of December 27.

RAILWAY AND OTHER MEETINGS

Mexican Railway Co. Ltd.

The 141st ordinary general meeting of the Mexican Railway Company Limited was held at Winchester House, Old Broad Street, E.C.4, on December 18, the Chairman (Mr. Vincent W. Yorke) presiding.

The Secretary (Mr. C. Tennant) read the notice convening the meeting and the auditors' report.

In moving the adoption of the report and accounts for the half-year ended June 30 last, the Chairman said the gross receipts for the first half of the year were by no means unsatisfactory and showed an increase of 6.3 per cent. on those of the corresponding half-year in spite of an actual decrease in passenger earnings of 3.7 per cent. The falling off in these earnings was undoubtedly due to the curtailment of tourist traffic brought about by the several disasters to ships of the Ward Line, and did not reflect any decrease in the spending power of the ordinary passenger. Goods traffic, which showed an increase of 9.5 per cent., had been substantially swollen by large consignments from Europe of cast iron pipes for the drainage of Mexico City, of which they carried nearly 15,000 tons during the half-year. The large increase in sundry receipts amounting to 47.7 per cent. was purely a matter of bookkeeping, amounts received for wagon hire from other railways having been credited to receipts, instead of being deducted from operating expenses. Fuel oil for the second half-year in succession showed a very serious falling off of 18,000 tons in weight and \$173,000 in money, which had been due as before to the competition of the Aguila Company's pipeline.

If they had been able to maintain their expenses more or less at the level of the corresponding half-year, they might really have improved the position, but these unfortunately showed the disheartening increase of 9.6 per cent. Of the increase amounting to just over \$500,000 no less than \$320,000 was directly attributable to concessions to employees such as increased rates of pay, payment for the day of rest, and higher pensions. The final results were, therefore, most unsatisfactory as, in spite of the substantial increase in gross earnings, the net earnings had fallen from \$757,500 to \$632,700, a decrease of nearly \$125,000. As naturally followed, the increase in gross earnings had entailed an increase in tonnage and they carried 28,500 more tons than in the corresponding half-year. This had thrown a fresh strain on their already over-taxed equipment and had brought into even clearer relief the necessity for fresh expenditure on renewals account.

Regarding a renewal of the moratorium which expired at the end of the year, they had approached the debenture

holders with a new scheme of arrangement last month. The new scheme, which followed very closely on the old, was to last for a further three years, with a new clause inserted which gave power to the trustees to determine it under certain circumstances, and provided for the payment to the 6 per cent. debenture holders of six months interest to December 31, 1932, with interest at the prescribed rate added to date. The scheme was passed by a large majority in every class of their debenture holders, and had subsequently been approved by the Court of Chancery. It would come into operation about December 20.

Referring to the current half-year's results, the Chairman said although

the gross earnings continued to show a satisfactory increase, say 10.8 per cent., the net earnings for the four months were only \$27,700, expenses having increased by 19.8 per cent. As to general conditions, the recovery in business had continued, mining business was flourishing, the cotton factories were full of work, and agricultural prospects were quite good. On the other hand, the uncertain situation of silver, and the apparent reversal of policy by the United States Government regarding this metal, might have a depressing influence on business in Mexico.

The Chairman concluded by reading a telegram just received from the General Manager, Mr. J. D. W. Holmes, and again spoke in high terms of praise of the work of the General Manager and Heads of Departments during and since the last half-year.

The report and accounts were unanimously adopted.

British Automatic Co. Ltd.

The 48th ordinary general meeting of the British Automatic Co. Ltd. was held at Winchester House, Old Broad Street, E.C.2, on Tuesday, December 17, Major Robert Douglas Kingsdown Curling, M.C. (Chairman and Managing Director) presiding.

The Secretary (Mr. William A. Ballard) read the notice convening the meeting and the auditors' report.

Before moving the adoption of the report and accounts, the Chairman referred sympathetically to the absence of Mr. T. M. Till, O.B.E. (Deputy Chairman and Deputy Managing Director) through illness.

After careful consideration, he said, the directors had decided that the company's financial year should end, and the accounts be closed, on December 31 each year, instead of as hitherto on September 30. They had come to this decision because, with September 30 as the end of the company's financial year, the books had to be closed and the accounts prepared before the end of their busiest trading period. This meant that stocks had to be taken and other records compiled at a time when there was still considerable trading activity, so that instead of showing the results of one complete season's working, they showed only the end of one season's workings and three-fourths of the next. These inconveniences had become more pronounced during the past few years with the extension of the company's amusement business, and in the case of one of the subsidiary companies, by the development of their trade in chocolate and confectionery where Christmas was the real culmination of the trading for the year. It would thus be seen that December 31 was the natural and most convenient date to which the company's accounts should be made up.

With regard to the results for the year ended September 30, although

complete accounts had not been prepared, their records showed that the company's business had improved in comparison with that of the previous year, and the takings from the automatic machines had continued to show an increase since September 30. By reason of the fact that November and December were the beginning of the quietest period in the company's trading year, the accounts for the 15 months to December 31 would not show a proportionately increased result in comparison with the 12 months to September.

The Chairman explained that as another annual general meeting would be held next March, when a full review of the company's operations up to the end of December would be made, he did not propose to say anything more about the business then. During the period under review, the company refunded the whole of the £250,000 8 per cent. first mortgage debenture stock by an issue, made in February last of £250,000 5½ per cent. first mortgage debenture stock. Holders of £213,300 of the 8 per cent. stock converted their holdings into the 5½ per cent. stock, and the remaining £36,700 was subscribed for by stockholders in cash.

When the present board took office in 1929, they found that the reserve fund investments of the company had been sold and re-invested in securities which at that time were practically worthless. Among these were two allotment letters for shares in Steel Industries of Great Britain, but as the validity of these documents was contested by that company, the directors were unable to place any value on this investment at the time. He was pleased to report that, after protracted negotiations, a compromise was arrived at during the year under review which, although involving a heavy loss

on the original investment, had resulted in a payment in cash to the company of a substantial sum of money.

Staff Pension Scheme

The absence of a staff pension scheme had long been recognised as a disadvantage, and many years ago, the shareholders voted sums of money for the purpose of starting such a scheme. In 1929, the pension fund investments were valued at nearly £60,000 but unfortunately the major part of that sum was lost along with the reserve fund investments of the company. To start a pension scheme, even on a contributory basis, which would provide reasonable pensions for employees retiring at 65 years of age, a substantial sum of money was required to give the employees with long service, at the time the scheme started, some credit in their pensions for past services. The amount they had now received in settlement from Steel Industries had enabled the directors to earmark a part of this sum towards the founding of a scheme. This had been arranged in such a way as to protect the contributions both of the employees and of the company, so preventing any possibility of a repetition of the unfortunate happenings in 1929. In other words, whatever happened to the company the employees would be safe, he concluded.

The motion to adopt the report was seconded by Colonel William Parker and carried.

Mr. M. S. Lennie was re-elected a director and Messrs. Peat, Marwick, Mitchell & Company were re-appointed auditors.

Mr. H. T. Ripsher, moving a vote of thanks to the Chairman and directors, said he was sure the shareholders were well satisfied with the steps that had been taken during the past year towards bringing the company back towards prosperity.

Railway and Other Reports

British Automatic Co. Ltd.—The directors have decided to alter the date for closing the accounts from September 30 to December 31. In order to comply with the provisions of the Companies Act, 1929, the Board of Trade has assented to the accounts as at September 30, 1934, being again presented at the annual general meeting which was held on December 17. The next balance-sheet and profit and loss account will cover the 15 months to December 31, 1935, and will be presented to the shareholders before March 31 next. Trading results up to September 30, 1935, show an improvement compared with the previous year. During the period under review, the company refunded the £250,000 8 per cent. first mortgage debenture stock by an issue of 5½ per cent. first mortgage debenture stock.

The Superheater Co. Ltd.

Silver jubilee commemoration dinner at the Savoy Hotel

To mark the completion of 25 years of activity and commemorate the silver jubilee of the concern, the Superheater Co. Ltd., on Thursday evening, December 12, gave a dinner at the Savoy Hotel to which a large number of engineers and others were invited. The guests, to the number of about 140, were received by Mr. Alex Spencer, Chairman, and Mr. E. A. Robinson, M.C., Managing Director of the company. They comprised the following:—

Messrs. C. E. Adams, Chas. Adamson, W. A. Agnew, J. Alcock, J. Allan; Major H. L. Armstrong.

Messrs. H. H. Baker, W. Kelway Bamber; Capt. H. P. M. Beames; Messrs. A. R. Bell, A. W. Bolden, T. E. Boothby, P. R. Boulton, Geo. L. Bourne, A. J. Boyd, J. Bruce, O. V. Bulleid.

Messrs. L. A. Callow, A. E. Campbell, A. C. Carr, G. Carr, H. Chambers, H. Clarke, Col. J. Sealy Clarke; Messrs. J. Clayton, N. A. Collard; H. Hinton Cooper; Lt.-Col. Stapleton Cotton; Mr. W. A. Cullen.

Messrs. G. Cole Deacon, N. B. Dickson, W. Dixon, S. B. Donkin, J. Duncan.

Mr. W. S. Edwards; Sir J. Duncan Elliott; Messrs. B. P. Ellis, J. S. Evenden.

Messrs. R. E. Fordham, J. P. Forsyth, Bert-ram D. Fox.

Messrs. C. Bruce Gardner, E. Graham, W. Grainger, H. E. Geer, D. C. Lyett Green, H. N. Gresley, S. Groom, R. H. Gummer.

Messrs. F. Hall, R. J. Harvey, C. G. Hatherley; Sir Brodie H. Henderson; Neil B. Henderson; The Hon. Philip Henderson; Messrs. T. E. Heywood, C. W. C. Hine; Sir Follett Holt; Messrs. E. Earnshaw Howell, G. Hughes.

Messrs. H. Jackson, A. M. Jacobs, J. Johnson, F. Evelyn Jones, P. L. Jones, S. N. Kent.

Messrs. C. S. Lake, H. W. Lee, R. Lee, E. J. H. Lemon, F. A. Lemon, A. H. L'Herminier, J. C. Lloyd.

Messrs. A. D. Mackenzie, A. Magis, R. E. L. Maunsell, A. E. McKenzie, A. W. Meacock, H. Melhuish, E. A. Mills, E. Morgan, Norman Morris; Lt.-Col. A. H. L. Mount; Messrs. H. Mount, R. E. Moynihan, G. A. Musgrave.

Messrs. W. R. Oaten, J. Peacock, Loughnan St. L. Pendred, F. G. Penny, F. D. Playford, G. Portham, R. S. Portham, H. S. Potter, R. B. Potter, F. Powell, K. Preston, F. W. Purse.

Messrs. W. H. Robertson, E. A. Robinson, J. G. Robinson, R. A. Riddles, A. P. Ross.

Messrs. C. R. Salmon, W. M. Selvey, J. Silver, G. Simpson, E. Slater; Major R. A. Smeddle; Messrs. Alex Spencer, W. A. Stanier, C. M. Stedman, C. M. Stein; Lt.-Col. H. A. Stenning; Messrs. S. J. Symes, G. S. Szlumper.

Messrs. J. R. Tait, T. L. Taylor, R. E. Trevithick, R. A. Thom, I. J. Thomas, T. G. Thomas, E. Thompson, Julian S. Tritton; Sir Seymour B. Tritton.

Messrs. D. C. Urie, J. A. Vice, C. Walker, A. T. Wall, E. C. Ward, W. L. Watson, Bruce G. White, H. Wilmot, M. A. Wolf, J. E. Wood, W. J. H. Wood.

A very attractive four-page blue and silver menu card had been prepared for the occasion, showing on the outer cover a 4-4-0 type locomotive of 1910 and below the *Silver Link* engine of the L.N.E.R., the inscription, surmounted by the well known McLesCo sign, reading "The Superheater Co. Ltd. Silver Jubilee 1910-1935, Savoy Hotel, December 12, 1935." A definition by Whipple of the word "wit" and a sketch of the world's first steam engine, Hero's (presumably non-superheated) adorned two of the inside pages, other pages apart from

those of the actual menu giving the names of the musical and cabaret artistes, and concluded with the following appropriate verse:—

"Lest old acquaintance be forgot,
Or dimmed by memory's loss,
Just take your pencil or your pen
And here indite your X."

The proceedings throughout were conducted in an atmosphere of informality and good fellowship, the few speeches being for the most part framed in a spirit of banter with, however, a leavening of a less humorous kind to indicate that the speakers, as no doubt all present, were fully alive to the significance of the occasion as representing the attainment of a landmark in the affairs of their hosts. The Superheater Co. Ltd., as is generally felt, deserves the success with which its efforts have been rewarded after what, in the early stages, was a hard fight to establish and develop one of the greatest improvements yet contributed to the science of steam engineering.

Welcoming the guests in a short speech Mr. Alex Spencer said that he was pleased to see everybody at this somewhat infantile jubilee and he was particularly gratified that it was possible to arrange the function on a date which coincided with a short visit from the United States of Mr. George L. Bourne, a pioneer of superheating, so enabling him to be present. There were to be no formal speeches and he hoped that everyone would thoroughly enjoy themselves.

Mr. Bourne in replying expressed his pleasure in being present and referred to the great part that the pioneers of superheating had taken in making the apparatus practicable of use. He referred specially to Dr. Wilhelm Schmidt and Dr. Robert Garbe in Germany, and Messrs. H. A. Ivatt, J. G. Robinson, R. S. Portham, Geo. Hughes, Leslie Robertson and Lt.-Col. H. A. Stenning in this country. These references were cleverly interpolated by jocular remarks. Mr. Bourne, after referring to Mr. Alex. Spencer, as one who had steered the ship for some years past, stated that at the present time some 400,000,000 horsepower employs superheated steam.

The series of light, humorous speeches was concluded by some characteristic remarks from Mr. E. J. H. Lemon and a programme of musical and cabaret items brought a very happy evening to a close at about 11.0 p.m.

L.M.S.R. GIFT TO CREWE LIBRARY.—The L.M.S.R. has presented to Crewe Town Council the library of 23,000 books and news-room which the company has previously run on a subscription basis. It will now be used as a free library, and the council will pay a nominal rental of £10 a year for the building.

NOTES AND NEWS

The Vatican Railway.—The first goods train to enter the Vatican City arrived on Friday, December 13, with 12 wagon-loads of books published by Roman Catholics in all parts of the world.

Blue Arrow Freight Service.—A registered transit scheme for all traffic (including livestock) normally accepted by passenger train, to be known as the Blue Arrow service, will be introduced on January 1, 1936, and will be available on payment of a registration fee of 2s. 6d. per consignment.

New G.W.R. Train Service.—In connection with the recently introduced additional cheap day bookings to London, a new late evening train service began on December 16 on Mondays and Wednesdays at 9.25 p.m. from Paddington to Swindon (arrival 11.15 p.m.), Chippenham (arrival 11.40 p.m.), Melksham (arrival 11.50 p.m.), Trowbridge (arrival 12.0 midnight), and Westbury (arrival 12.10 a.m.).

L.N.E.R. Mechanics' Institute Prizegiving.—Mr. William Whitelaw, Chairman of the L.N.E.R., presented the prizes to students of the Great Eastern Mechanics' Institute at the Town Hall, Stratford, on December 11. Sir Ralph L. Wedgwood, Chief General Manager of the company, was also present. Mr. F. G. Perry, secretary of the Institute, said in his report that the aggregate number of students attending all courses was 529.

Travel Luncheon Club.—This year the Travel Luncheon Club departed from its previous practice of holding a Christmas Luncheon and instead arranged a dinner, dance, and cabaret, which was held last Wednesday evening at the Hotel Splendide, Piccadilly, and proved a most successful function. Mr. H. G. Dring (European Passenger Manager, Canadian Pacific Railway, and Chairman of the Committee of the Travel Luncheon Club) and Mrs. Dring, received the guests. The toast of "The Guests" was proposed by Colonel G. S. Szlumper, and responded to by Mrs. J. B. Elliot. Mr. Tom Potter, Secretary, and Mr. Shirley James, received many congratulations on the success of their efforts in organising the function.

New L.N.E.R. Seat Reservation System.—The L.N.E.R. is introducing a system of seat reservation on main line trains similar to that in use for theatre bookings. This system is already in use for the Flying Scotsman, the Pullman trains and the Silver Jubilee, but it is now being extended to practically all important trains leaving King's Cross. It will permit upwards of 200 auxiliary ticket agencies and suburban stations to reserve seats by telephone, and to issue tickets upon demand showing particulars of the seats so reserved. An integral part of the scheme is the provision of a new public enquiry office on No. 10 platform at

King's Cross station, where the work will be centralised. This office will be double the superficial area of the existing office, and will be provided with two entrance doors and a central exit together with ten additional telephones. The new premises, which will project on to the platform, are to be provided with an attractive exterior.

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for the month of October, 1935, amounted to \$14,198,000, an increase of \$1,446,000 in comparison with October, 1934. In the working expenses of \$9,949,000 there was an increase of \$1,297,000, leaving net earnings \$149,000 higher, at \$4,249,000. For the ten months to October 31, 1935, gross earnings were \$106,238,000, an increase of \$2,585,000, and net earnings \$15,636,000, a decrease of \$2,135,000.

Canadian National Earnings.—For the month of October, 1935, gross earnings of the Canadian National Railways amounted to \$17,825,909, an increase of \$2,022,617 in comparison with October, 1934. Operating expenses (\$14,195,774) at the same time advanced by \$1,201,911, leaving net earnings \$820,706 higher, at \$3,630,135. Aggregate gross earnings from January 1 to October 31, 1935, were \$142,956,088, an improvement of \$5,190,087, but the aggregate net earnings of \$9,795,799 showed a decrease of \$156,134.

Kenview Model Railway.—The Kenview Model Railway, at "Deansgarth," The Bishops Avenue, East Finchley, N.2., will work daily from December 21 to December 29, inclusive. There will be no charge for visitors, but the usual contributions to charity may be made and a share of the proceeds will be given to the Railway Benevolent Institution. The period of continuous running will be inaugurated on Saturday at 3 p.m. by Sir Charles Morgan Webb, and the hours at which it will take place are from 11 a.m. to 1 p.m. and from 3 p.m. to 5 p.m. daily. There will also be continuous running between those hours on January 3 and January 4.

Railway Club Dinner.—The annual dinner of the Railway Club was held at the Broad Street station restaurant of the L.M.S.R. on Friday, December 13, when Mr. Kenneth Brown, the President, presided over a record gathering. Mr. Cecil J. Allen proposed the toast of "The Railway Club," and outlined the remarkable developments in the matter of speed that had taken place on many of the principal railway systems of the world during the past year. In responding to this toast the President gave a detailed description of his experiences as delegate for the Railway Club at the German railway centenary celebrations, to which we refer in an editorial note on page 1050. Mr. N. McCracken proposed the toast of "The Officers and Committee of the Railway Club," to

which Mr. H. A. Vallance, the Secretary, responded. The toast of "The Guests" was proposed by Mr. W. A. Willox and responded to by Mr. D. V. Levien, of the Great Western Railway, and Mr. John Quirey, of the Railway Rates Tribunal. The proceedings ended with a cinematograph film of the Lynton & Barnstaple Railway, taken by Mr. L. T. Catchpole immediately before its closing down last September.

Road Accidents.—The Ministry of Transport return for the week ended December 14 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year:—

	Killed, including deaths resulting from previous accidents		Injured
England	106	(132)	3,386 (3,690)
Wales	11	(11)	124 (160)
Scotland	11	(26)	333 (345)
	128	(167)	3,843 (4,195)

The total fatalities for the previous week were 124, as compared with 156 for the corresponding period of last year.

G.W.R. Lecture and Debating Society.—The premier gold medal for the prize essay competition which is organised annually by the G.W.R. Lecture and Debating Society has been won for the 1935-36 session by Mr. H. Marsh, of the Stores Department, Swindon, for an essay on "The Great Western Railway as an Index of National Economic Development During the Century of its Existence." Second prize was awarded to Mr. E. K. Walters, of the District Goods Manager's Office, Shrewsbury, for his paper on "Probable Developments in British Transport in the next Ten Years," and a consolation prize to Mr. E. H. Carter, of the Stationery Department, Paddington, who wrote on "The Individuality of the Great Western Railway." The adjudication of the essays was made known at the meeting of the Society held at Paddington on December 12, over which Sir Robert Horne, Chairman of the company, presided.

Presentation of Ambulance Awards at Bristol.—The Bristol ambulance class, which has the distinction of being the largest of any station on the Great Western Railway system, held its annual concert and distribution of awards at the Cadena Café on December 12, when Mr. R. Carpmael, Chief Engineer, presided over an enthusiastic gathering. Among those present were Mr. R. G. Pole, Divisional Superintendent, Mr. R. G. Barefoot, District Goods Manager, Mr. W. N. Pellow, Divisional Locomotive Superintendent, and Mr. S. W. Moore, Divisional Engineer. Col. G. A. Moore, Assistant Chief Commissioner of the St. John Ambulance Brigade, presented the awards, which included 214 gained in the 1935 examination by members of the class, in addition to a large number of the company's gold medals and bars

for 15, 20, 25 and 30 years' efficiency. Col. Moore, congratulating the recipients on their progress, said that from its small beginnings the ambulance movement had grown to be an essential part of the voluntary services of the country. Reports of the growth of the classes were given by Mr. E. E. Jakeway and Miss W. U. Smith, secretaries of the men's and women's classes respectively. The Billy Fields Limits concert party contributed an excellent entertainment.

Military Railway Experiences.

A lecture on his military railway experiences was given by Colonel W. G. Tyrrell, D.S.O., the Assistant Director of Transportation, War Office, at a meeting of the Darlington & District (L.N.E.R.) Lecture and Debating Society held on Wednesday, December 11, under the chairmanship of Mr. L. E. Marr, District Passenger Manager, L.N.E.R., York. With the aid of lantern slides, Colonel Tyrrell described the construction of the railway built to facilitate the advance of the army into

Palestine during the war, which started at Kantara and proceeded eastwards to Haifa, with branches to Beersheba and Jerusalem. The first part of the area traversed consisted of sandy desert, where it was necessary to circumvent or climb sand hills, whilst there were sandstorms and floods to contend with. The rate of construction of the railway, which was undertaken very largely by men drawn from the civil railway service, with the assistance of native labour, was dependent upon the progress of the army. The difficulties of the survey and construction were explained in detail by the lecturer, who demonstrated that, despite the obstacles, a well built railway was constructed which is still in operation. In the earlier stages the railway was composed entirely of single line, and a comparatively heavy traffic was conveyed over it, chiefly as a result of the institution of a form of control whereby a graphical record was kept of the progress of the trains similar to what is done in many existing train controls in this country.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 50th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
L.M.S.R. (6,923 mls.)						
Passenger-train traffic...	418,000	426,000	- 8,000	24,004,000	23,639,000	+ 365,000
Merchandise, &c. ...	511,000	479,000	+ 32,000	22,693,000	22,441,000	+ 252,000
Coal and coke ...	317,000	292,000	+ 25,000	11,711,000	11,530,000	+ 181,000
Goods-train traffic ...	828,000	771,000	+ 57,000	34,404,000	33,971,000	+ 433,000
Total receipts ...	1,246,000	1,197,000	+ 49,000	58,408,000	57,610,000	+ 798,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic...	276,000	282,000	- 6,000	15,725,000	15,415,000	+ 310,000
Merchandise, &c. ...	344,000	336,000	+ 8,000	15,825,000	15,869,000	- 44,000
Coal and coke ...	286,000	282,000	+ 4,000	11,346,000	11,457,000	- 111,000
Goods-train traffic ...	631,000	618,000	+ 12,000	27,171,000	27,326,000	- 155,000
Total receipts ...	906,000	900,000	+ 6,000	42,896,000	42,741,000	+ 155,000
G.W.R. (3,749½ mls.)						
Passenger-train traffic...	179,000	187,000	- 8,000	10,172,000	10,064,000	+ 108,000
Merchandise, &c. ...	192,000	191,000	+ 2,000	9,131,000	9,028,000	+ 103,000
Coal and coke ...	123,000	111,000	+ 12,000	5,023,000	5,007,000	+ 16,000
Goods-train traffic ...	315,000	301,000	+ 14,000	14,154,000	14,035,000	+ 119,000
Total receipts ...	494,000	488,000	+ 6,000	24,326,000	24,099,000	+ 227,000
S.R. (2,154 mls.)						
Passenger-train traffic...	245,000	255,000	- 10,000	14,876,000	14,482,000	+ 394,000
Merchandise, &c. ...	61,000	64,000	- 3,000	3,062,500	3,242,000	- 179,500
Coal and coke ...	39,000	38,000	+ 1,000	1,517,500	1,545,000	- 27,500
Goods-train traffic ...	100,000	102,000	- 2,000	4,570,000	4,787,000	- 217,000
Total receipts ...	345,000	357,000	- 12,000	19,446,000	19,269,000	+ 177,000
Liverpool Overhead ...	1,148	1,140	+ 8	58,817	56,811	+ 2,006
Mersey (4½ mls.) ...	4,415	4,346	+ 69	201,899	204,211	- 2,321
*London Passenger Transport Board ...	564,000	557,400	+ 6,600	13,075,300	12,858,300	+ 217,000
IRELAND						
Belfast & C.D. pass.	1,640	1,675	- 35	124,863	123,575	+ 1,288
" " goods	520	537	- 17	25,728	26,010	- 282
" " total	2,160	2,212	- 52	150,591	149,585	+ 1,006
Great Northern pass.	8,250	7,950	+ 300	521,050	496,500	+ 24,550
" " goods	9,300	8,600	+ 700	472,450	440,200	+ 32,250
" " total	17,550	16,550	+ 1,000	993,500	936,700	+ 56,800
Great Southern pass.	21,454	21,005	+ 449	1,218,623	1,191,054	+ 27,569
" " goods	48,904	45,207	+ 3,697	1,820,092	1,698,296	+ 121,796
" " total	70,358	66,212	+ 4,146	3,038,715	2,889,350	+ 149,365

* 24th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices	
			Dec. 18, 1935	Rise Fall
G.W.R.				
Cons. Ord.	66½	48½	50½	-½
5% Con. Prefce.	118	109	118½	-1
5% Red. Pref. (1950) ...	115	107	110½	-
4% Deb.	117	105	112*	-2
4½% Deb.	119	109	113½*	-2
4½% Deb.	129½	115½	122½*	-2
5% Deb.	135	126½	134½*	-2
2½% Deb.	75	64	72*	-1
5% Rt. Charge	134½	123½	133½*	-2
5% Cons. Guar.	132½	121½	132½	-1
L.M.S.R.				
Ord.	30½	19½	18	-
4% Prefce. (1923)	64½	41	53	-½
4% Prefce.	87	69½	83	-1.
5% Red. Pref. (1955) ...	107	92½	103½	-
4% Deb.	114½	100½	107½	-½
5% Red. Deb. (1952) ...	118½	111½	115½	-
4% Guar.	106½	96½	103	-2
L.N.E.R.				
5% Pref. Ord.	24½	13½	10	-
Def. Ord.	11½	6½	5½	-
4% First Prefce.	76	59½	58	-½
4% Second Prefce.	47	25½	20	-1
5% Red. Pref. (1955) ...	94½	80	79½	-1
4% First Guar.	104	92	100	-1
4% Second Guar.	97½	86½	92	-1
3% Deb.	90	74½	82	-2
4% Deb.	114	99½	107	-1
5% Red. Deb. (1947) ...	117	108	114½	-
4½% Sinking Fund Red. Deb.	111½	105½	109	-
SOUTHERN				
Pref. Ord.	90	63½	83	-1
Def. Ord.	32½	19	21½	-
5% Prefce.	118½	107½	118½	-1
5% Red. Pref. (1964) ...	115½	107½	113½	-
5% Guar. Prefce.	132	120½	133½	-1
5% Red. Guar. Pref. (1957) ...	119½	113	116½	-
4% Deb.	116½	103½	112	-1
5% Deb.	134	124½	133½	-
4% Red. Deb. 1962-67	113½	105½	111½	-
BELFAST & C.D.				
Ord.	6	5	9	-
FORTH BRIDGE				
4% Deb.	110	100	103½*	-2
4% Guar.	110	100	103½*	-1
G. NORTHERN (IRELAND)				
Ord.	95½	415½	17	+½
G. SOUTHERN (IRELAND)				
Ord.	25	12½	40½	-
Prefce.	21½	13½	49½	-½
Guar.	48	39	88½	-
Deb.	67	59	85½	-
L.P.T.B.				
4½% "A"	126	115	122½	-
5% "A"	135½	124½	133½	+1
4½% "T.F.A."	113½	107½	109½	-
5% "B"	131½	118	128½	-
"C"	97	73	108	-1
MERSEY				
Ord.	15½	7	22	+1
4% Perp. Deb.	93½	82½	97½	-
3% Perp. Deb.	66½	61½	76	-
3% Perp. Prefce.	54	44½	60½	-

* ex dividend

OFFICIAL NOTICES

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of:—

1. STEEL TYRES.
2. MOIST ZINC PAINT.

Specifications and forms of tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1. Tenders addressed to the Chairman and Directors of the South Indian Railway Company, Limited, marked "Tender for Steel Tyres," or as the case may be, with the name of the firm tendering, must be left with the undersigned not later than 12 noon on Friday, the 10th January, 1936, in respect of Specification No. 1. and not later than 12 noon on Friday, the 3rd January, 1936, in respect of Specification No. 2.

The Directors do not bind themselves to accept the lowest or any tender.

A charge, which will not be returned, will be made of 10s. for each copy of Specification No. 1. and of 5s. for each copy of Specification No. 2.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, London, S.W.1.

E. A. S. BELL,
Managing Director.

91, Petty France,
Westminster, S.W.1.
18th December, 1935.

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite Tenders for:—

- (1) 603 STEEL TYRES FOR LOCOMOTIVES, CARRIAGES AND WAGONS.

(Three Tyres for Locomotives, Broad Gauge, and 600 Tyres for Carriages and Wagons, Metre Gauge.)

- (2) 72 PAIRS WHEELS AND AXLES FOR CARRIAGES AND WAGONS (Metre Gauge).

Specifications and Forms of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, London, S.W.1. Fee ONE GUINEA each which will not be returned.

Tenders must be submitted not later than 2 o'clock p.m. on TUESDAY, 24 JANUARY, 1936.

The Directors do not bind themselves to accept the lowest or any tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,

G. W. V. DE RHE PHILIPS,
Secretary.

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for:—

- 450 STEEL TYRES.
- 250 DISC CENTRED WHEELS.

Specifications and forms of tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Thursday, 19th December, 1935.

A fee of 10s. will be charged for each copy of the Specification, which is not returnable. Tenders must be submitted not later than noon on Friday, 3rd January, 1936.

The Directors do not bind themselves to accept the lowest or any tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
T. R. WYNNE,
Managing Director.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—The Railway Gazette, 35, Tothill Street, Westminster, London, S.W.1.

CONTRACTS AND TENDERS

New Freight Wagons for L.M.S.R.

In addition to the extensive works and rolling stock programme for 1936 recently announced by the L.M.S.R. (see this column of our issue dated November 8) the company has ordered 3,040 new freight vehicles, the bulk of which will be obtained from the wagon building trade. As in the case of the major programme, the new wagons are quite distinct from the works to be constructed under the proposed Government guaranteed loan. Of the 3,040 freight vehicles, orders for 2,690 have been placed with the following firms:—

12-ton Open Merchandise Wagons	
Hurst, Nelson & Co. Ltd.	400
Metropolitan-Cammell Carriage & Wagon Co. Ltd.	300
R. Y. Pickering & Co. Ltd.	300
Birmingham Railway Carriage & Wagon Co. Ltd.	300
Butterley Co. Ltd.	200
G. R. Turner Limited	200
Craven's Railway Carriage & Wagon Co. Ltd.	150
Gloucester Railway Carriage & Wagon Co. Ltd.	150
20-ton Tube Wagons	
Charles Roberts & Co. Ltd.	200
20-ton Hopper Wagons	
Metropolitan-Cammell Carriage & Wagon Co. Ltd.	150
Birmingham Railway Carriage & Wagon Co. Ltd.	100
12-ton Medium Merchandise Wagons	
Charles Roberts & Co. Ltd.	240

D. Wickham & Co. Ltd. has received an order from the South African Railways & Harbours Board for 17 pump trolleys.

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies for one bogie inspection saloon and one third-class coach for 3-ft. 6-in. gauge service on the Gold Coast Government Railways.

The Patent Shaft & Axletree Co. Ltd. has received an order from the South

Indian Railway Administration, to the inspection of Messrs. Robt. White & Partners, for five 120-ft. through spans bridgework for single track and weighing approximately 400 tons.

Streamlined Electric Locomotives for New Zealand

The English Electric Co. Ltd. has received a contract from the New Zealand Government Railways Board for eight 1,340-h.p. electric locomotives for operating passenger, freight and mixed trains on the Wellington-Paekakariki section in the North Island. The new locomotives will be of the 2-8-4 type, weighing 84 tons, and having an overall length of 46 ft. They will be fitted with electro-pneumatic control and will operate from an overhead line at 1,500 volts direct current. These will be the first British electric locomotives to be streamlined. Other points of engineering interest are embodied in the motor drive, ventilation and heating arrangements. The four driving motors are to be spring-borne and transmit their power to the driving axles through flexible spring cup gear. The ingress of air to the locomotives is provided with filters so that not only the main motors which are forced-ventilated, but all auxiliary motors and the control gear are provided with dust-free ventilation. Each locomotive will carry an oil-fired boiler to supply the steam heat for the passenger coaches.

Of the eight locomotives comprising the order, one will be built complete in England, and the New Zealand Government Railways will build the mechanical portions of the remaining seven in their own shops, obtaining the axles, wheels, air brakes and other details from this country. The English-built mechanical

parts will be manufactured by R. & W. Hawthorn, Leslie & Co. Ltd., and the eight electrical equipments by the English Electric Co. Ltd. This order covers the locomotives for the third section of main line electrification in New Zealand (the Wellington-Paekakariki section in the North Island), both previous sections, viz., Arthur's Pass and Christchurch-Lyttelton in the South Island having been equipped by the English Electric Co. Ltd.

The new Tawa Flat deviation, which forms a part of the Wellington-Paekakariki section of the Wellington-Auckland main trunk line, on which the locomotives will work, avoids long 1 in 40 gradients over mountainous country soon after the line leaves Wellington City, and will greatly reduce running costs, as well as assist to speed up the main railway traffic. It was described in an illustrated article in THE RAILWAY GAZETTE of November 10, 1933. This electrification is part of a comprehensive reorganisation of the whole of the terminal system at Wellington, where also the new railway station is under construction, as described in THE RAILWAY GAZETTE from time to time.

R. & W. Hawthorn, Leslie & Co. Ltd. has received an order from the Crown Agents for the Colonies for three boilers for 105-cm. gauge locomotive, Palestine Railways.

Robert Stephenson & Co. Ltd. has received an order from the Crown Agents for the Colonies for 16 locomotive boilers for standard gauge 4-6-0 and 4-6-2 locomotives, Palestine Railways.

The Egyptian State Railways Administration has placed orders with N. V. Montan Export for carriage and wagon tyres (total price, £2,539) and with Mavis Export & Trading Co. Ltd. for 8,800 metric tons sized coal for power houses at £1 6s. 8d. per ton, delivered c.i.f. Alexandria.

Railway Share Market

After commencing the week in a very subdued state the stock and share markets developed a strong tone on Tuesday afternoon. The volume of buying in various sections of markets just prior to Christmas caused some surprise. As far as home railway stocks were concerned the improvement was attributed to brighter prospects respecting the coal trade negotiations. Speculative interest in Southern preferred ordinary and deferred ordinary stocks was renewed and the declaration of the House of Lords judgment in regard to the rating assessment appeal is being impatiently awaited as many buyers have bought on the prospect of the decision being given before the last working day of the current Stock Exchange account.

It is possible that any strong movement in the price of the stock may not develop until after the account, even if the judgment is in favour of the Southern Railway, since it is improbable that prospective buyers would be prepared to take the stock off the hands of speculative operators at a big advance. When it is realised, however, that a favourable judgment would probably mean payment of the full 5 per cent. on the preferred ordinary stock, thus showing a yield of about 6 per cent. at the present price, it is anticipated that buyers will be forthcoming from among those investors who require a high-yielding and reasonably secure investment. The weekly traffic returns were not very favourable on Wednesday, although it had been anticipated that

weather conditions had operated against any increase in receipts on the Southern.

Foreign railway stocks attracted more attention than for some time. Although Argentine issues were a less active market attention was turned to Brazilian issues where some good advances were recorded. San Paulo ordinary stock was marked up several points on the announcement of the Government's approval of a 15 per cent. increase in freight rates on all passengers and goods (except coffee) to come into force from January 1. Leopoldina Railway debenture stock also advanced in sympathy with the movement, as it is hoped that the San Paulo decision may be followed by a favourable outcome of the negotiations now taking place between that company and the Government.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles Open 1934-35	Week Ending	Traffics for Week		No. of Weeks	Aggregate Traffics to Date			Shares or Stock	Prices						
			Total this year	Inc. or Dec. compared with 1934		Totals		Increase or Decrease		Highest 1934	Lowest 1934	Dec. 18, 1935	Yield % (See Note)			
						This Year	Last Year									
South & Central America.	Antofagasta (Chili) & Bolivia	830	15.12.35	£ 15,310	—	£ 2,940	50	630,820	£ 748,730	—	117,910	Ord. Stk.	263 1/2	19	20	Nil
	Argentine North Eastern ..	753	14.12.35	7,133	+	303	24	196,017	179,286	+	16,731	A. Deb.	11	52	45	60 1/2
	Argentine Transandine ..	—	—	—	—	—	—	—	—	—	—	6 p.c. Deb.	10	10	10	Nil
	Bolivar	174	Nov., 1935	6,000	+	250	48	66,600	63,700	+	900	Bonds.	135 1/2	107 1/2	13	31 1/2
	Brazil	—	—	—	—	—	—	—	—	—	—	Ord. Stk.	161 1/2	81 1/2	8	Nil
	Buenos Ayres & Pacific ..	2,806	14.12.35	£ 82,609	+	13,369	24	1,781,123	1,649,806	+	131,317	Ord. Stk.	23	10	13	Nil
	Buenos Ayres Central ..	190	30.11.35	£ 117,300	+	£ 8,800	22	£ 2,712,600	£ 2,743,800	—	£ 33,200	Mt. Deb.	23	10	13	Nil
	Buenos Ayres Gt. Southern	5,085	14.12.35	131,434	—	2,777	24	2,851,489	2,895,863	—	44,374	Ord. Stk.	35	22	18 1/2	Nil
	Buenos Ayres Western ..	1,930	14.12.35	52,761	—	8,901	24	974,122	991,998	—	17,876	"	27 1/2	18 1/2	14 1/2	Nil
	Central Argentine	3,700	14.12.35	116,384	+	13,267	24	2,795,488	2,766,791	+	28,697	"	23	13 1/2	12 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	—	—	Dfd.	14	7	5	Nil
	Cent. Uruguay of M. Video	273	7.12.35	13,947	+	2,029	23	224,910	380,566	—	155,656	Ord. Stk.	151 1/2	3	5	Nil
	Do. Eastern Extn. ..	311	7.12.35	2,315	+	275	23	36,689	38,705	—	2,016	"	—	—	—	—
	Do. Northern Extn. ..	185	7.12.35	1,497	+	418	23	26,084	20,873	+	5,211	"	—	—	—	—
	Do. Western Extn. ..	211	7.12.35	961	+	274	23	17,684	16,977	+	707	"	—	—	—	—
	Cordoba Central	1,218	14.12.35	24,850	—	2,580	24	732,680	722,330	+	10,350	Ord. Inc.	6	3	2	Nil
	Costa Rica	188	Oct., 1935	11,634	—	2,012	17	55,349	63,485	—	8,136	Stk.	303 1/2	231 1/2	34	5 1/2
	Dorada	70	Nov., 1935	13,300	+	2,900	48	130,700	112,800	+	17,900	1 Mt. Db.	103	95	102 1/2	5 1/2
	Entre Rios	810	14.12.35	10,905	—	3,563	24	276,220	280,960	—	4,740	Ord. Stk.	211 1/2	12	10	Nil
	Great Western of Brazil ..	1,082	14.12.35	12,800	—	1,200	50	394,360	452,100	—	57,800	Ord. Sh.	7 1/2	3 1/2	1 1/2	Nil
International of C. Amer.	794	Oct., 1935	\$ 294,856	—	\$ 11,293	43	\$ 3,844,110	\$ 3,946,051	—	\$ 101,941	—	—	—	—	—	
Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	—	—	1st Pref.	1 1/2	1 1/2	1 1/2	Nil	
La Guaira & Caracas ..	223 1/2	Nov., 1935	3,260	+	175	48	41,145	39,150	+	1,995	Stk.	125 1/2	76 1/2	81 1/2	Nil	
Leopoldina	1,918	14.12.35	16,734	—	1,189	50	898,948	1,098,959	—	200,011	Ord. Stk.	145 1/2	7	8	Nil	
Mexican	483	14.12.35	\$ 266,800	+	\$ 7,100	24	\$ 5,933,200	\$ 5,392,400	+	\$ 540,800	"	314	11 1/2	1 1/2	5 1/2	
Midland of Uruguay ..	319	Nov., 1935	8,356	—	5,180	22	30,701	52,325	—	21,624	"	11 1/2	1 1/2	2 1/2	Nil	
Nitrate	401	15.12.35	6,961	+	630	50	146,582	129,064	+	17,518	Ord. Sh.	32 1/2	51 1/2	2 1/2	Nil	
Paraguay Central	274	14.12.35	\$ 32,359,000	+	\$ 1,355,000	24	\$ 48,843,000	\$ 23,535,000	+	\$ 25,308,000	Pr. Li. Stk.	84	67	78 1/2	7 1/2	
Peruvian Corporation ..	1,059	Nov., 1935	76,125	+	17,432	22	375,790	309,538	+	66,252	Pref.	141 1/2	8	10	Nil	
Salvador	100	7.12.35	\$ 19,700	—	\$ 725	23	\$ 283,546	\$ 246,652	+	\$ 36,894	Pr. Li. Db.	75	70	65	7 1/2	
San Paulo	153 1/2	8.12.35	22,583	—	9,187	49	1,241,728	1,336,597	—	94,863	Ord. Stk.	86	67	51	4 1/2	
Taltal	164	Nov., 1935	4,005	+	1,780	22	16,645	11,430	+	5,215	Ord. Sh.	21 1/2	17 1/2	15 1/2	7 1/2	
United of Havana	1,353	14.12.35	13,059	—	1,312	24	369,229	390,012	—	20,783	Ord. Stk.	6	2	2	Nil	
Uruguay Northern	73	Nov., 1935	1,106	—	216	22	3,633	5,766	—	2,133	Deb. Stk.	64 1/2	3	4 1/2	Nil	
Canada.	Canadian National	23,688	7.12.35	688,573	+	87,983	49	32,330,532	30,910,194	+	1,420,338	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—	—	4 p.c.	78 1/4	51 1/2	66 1/2	6	4
	Grand Trunk	—	—	—	—	—	—	—	—	—	Perp. Dbs.	104 1/2	97 1/2	99 1/2	4	4
Canada.	Canadian Pacific	17,224	14.12.35	536,600	+	57,200	50	24,714,600	23,969,000	+	745,600	Ord. Stk.	185 1/2	111 1/2	111 1/2	Nil
India.	Assam Bengal	1,329	20.11.35	38,947	—	238	33	785,151	901,951	—	116,800	Ord. Stk.	88 1/2	72	82 1/2	3 1/2
	Barsi Light	202	20.11.35	3,135	—	1,365	33	90,720	92,220	—	1,500	Ord. Sh.	104 1/2	98 1/2	78 1/2	6 1/2
	Bengal & North Western ..	2,112	30.11.35	73,657	—	1,530	34	400,178	391,495	+	8,683	Ord. Stk.	297 1/2	262	299 1/2	5 1/2
	Bengal Doonars & Extension	161	20.11.35	5,013	+	102	33	90,483	100,906	—	10,423	"	125 1/4	124	123 1/2	5 1/2
	Bengal-Nagpur	3,268	10.11.35	169,800	+	19,489	32	3,844,315	3,521,566	+	322,749	"	105 1/2	96	101 1/2	3 1/2
	Bombay, Baroda & C. India	3,072	10.12.35	226,200	—	28,125	36	5,449,500	5,439,900	—	9,600	"	115	108 1/2	110 1/2	5 1/2
	Madras & South'n Mahratta	3,230	20.11.35	131,175	—	7,614	33	3,355,819	3,624,035	—	268,216	"	131	122 1/2	115 1/2	7 1/2
	Rohilkund & Kumaon ..	572	30.11.35	12,422	—	872	34	67,637	70,842	—	3,205	"	263	250	286 1/2	5 1/2
	South India	2,526	20.11.35	91,741	—	12,887	33	2,548,936	2,686,796	—	137,860	"	119	115	105 1/2	7 1/2
Various.	Beira-Umtali	204	Oct., 1935	65,747	+	4,612	4	65,747	61,135	+	4,612	—	—	—	—	—
	Bilbao River & Cantabrian	15	Nov., 1935	1,900	—	286	48	16,953	18,333	—	1,380	—	—	—	—	—
	Egyptian Delta	622	20.11.35	10,250	+	2,016	33	154,551	149,246	+	5,305	Prf. Sh.	215 1/2	134	134	51 1/2
	Great Southern of Spain ..	104	7.12.35	1,471	—	1,096	49	88,118	110,594	—	22,476	Inc. Deb.	4	31 1/2	31 1/2	Nil
	Kenya & Uganda	1,625	Oct., 1935	193,202	+	28,246	43	2,002,143	1,859,872	+	142,271	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	—	B. Deb.	50	33	37	9 1/2	
	Mashonaland	913	Oct., 1935	111,983	—	5,290	4	111,983	117,273	—	5,290	1 Mt. Db.	101	91 1/2	102	4 1/2
	Midland of W. Australia ..	277	Oct., 1935	17,060	—	296	17	54,262	56,354	—	2,092	Inc. Deb.	100	93	92 1/2	5 1/2
	Nigerian	1,905	2.11.35	61,332	—	26,448	31	804,490	865,363	—	60,873	—	—	—	—	—
	Rhodesia	1,538	Oct., 1935	202,694	+	13,135	4	202,694	189,559	+	13,135	4 p.c. Db.	104 1/2	97 1/2	104	3 1/2
South African	13,246	23.11.35	619,058	+	88,155	34	19,053,063	17,251,789	+	1,801,274	—	—	—	—	—	
Victorian	4,728	Aug., 1935	736,134	+	4,008	0	1,449,523	1,433,140	—	16,383	—	—	—	—	—	
Zafra & Huelva	112	Oct., 1935	12,687	—	1,072	4	114,122	116,325	—	2,203	—	—	—	—	—	

Note.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value